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NOTES ON SOME ASIATIC FINCHES¹

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INTRODUCTION

This paper is a report on the finches of the subfamily Carduelinae collected by Walter Koelz in Persia, Afghanistan, and northern India. The Emberizinae will be covered in a separate paper.

I wish to thank the authorities of the United States National Museum, the Chicago Natural History Museum, the Academy of Natural Sciences of Philadelphia, and the Museum of Comparative Zoölogy for the prompt and generous loan of some of their specimens. Mr. H. Grote of the Berlin Museum, with characteristic kindness, has furnished pertinent records from Russian literature that were not available or that I might have overlooked.

Throughout, Ernst Mayr has been my inspiring mentor, and I am deeply grateful for his friendly and continuing interest.

***Fringilla coelebs coelebs* Linnaeus**

PERSIA: Azerbaijan: Tabriz, October 30, 1940, 2 ad. ♂, 1 ad. ♀, 3 juv. ♀; Ardebil, November 2-4, 4 ad. ♂, 4 ad. ♀; Sarab, November 9, 1 ad. ♂; Maraghe, November 28-30, 2 ad. ♂, 2 ad. ♀; Rezaieh, December 6-7, 3 ad. ♂. Iran: Tehran, October 21, 1 ad. ♀; Kazvin, October 23, 1 ad. ♂; Karaj, October 26-31, 1945, 2 ad. ♀, November 14-15, 2 ad. ♂, December 7, 1944, 1 ad. ♂; Maskun, February 11, 1940, 3 ad. ♀; Isfahan, March 3-5, 6 ad. ♂, 5 ad. ♀; Hamadan, December 20-23, 2 ad. ♀. Kirman: Balvard, December 30-31, 1939, 2 ad. ♀; Dehishib, January 17, 1940, 2 ad. ♀. Yezd: Taft, February 23, 1 ad. ♂, 1 ad. ♀. Fars: Eglit, March 8, 1 ad. ♀; Shiraz, March 15-16, 3 ad. ♀; Jahrum, March 21, 1 ad. ♀; Niriz, March 29, 2 ad. ♀. Bakhtiari: Ti, February 3-14, 1941, 7 ad. ♂; Imarat, February 15-20, 4 ad. ♂, 3 ad. ♀.

¹ Notes from the Walter Koelz Collections, Number 2. Number 1 of this subseries is American Museum Novitates, no. 1406, 1949.

Luristan: Burujird, January 20, 1941, 1 ad. ♂, 1 ad. ♀; Durud, January 23–March 15, 7 ad. ♂, 6 ad. ♀, 1 juv. ♀, October 22–26, 1 ad. ♂, 1 ad. ♀. Kermanshah: Qasr i Shirin, December 28, 1940–January 9, 1941, 3 ad. ♂, 7 ad. ♀; Surkhidizeh, January 10, 1 juv. ♀.

AFGHANISTAN: Burchao Pass, October 10–15, 1939, 1 ad. ♂, 5 ad. ♀, 1 juv. ♀; Maimana, November 16–17, 1937, 2 ad. ♂, 2 ad. ♀.

These specimens cannot be distinguished from specimens of nominate *coelebs* from northern Europe and appear to be winter visitors.

***Fringilla coelebs alexandrovi* Zarudny and Bilkevitch**

PERSIA: DARK FORM: Mazenderan (region of Gurgan): Ahangarmahali, July 14, 1940, 1 ad. ♀; Gozlu, July 15, 3 ad. ♂, 1 imm. ♂, 1 ad. ♀; Karimserai, July 21, 1 ad. ♂; Dimalu, July 22–24, 3 ad. ♂, 1 ad. ♀; Gurgan, September 30, 1 imm. ♀.

LIGHT FORM: Mazenderan (region of Gurgan): Kherat, July 27, 1940, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀, September 30, 2 ad. ♂, 1 ad. ♀. Khorasan: Kotaliyekchinar, August 4, 3 ad. ♀; Turbat i Haidari, September 10–13, 3 ad. ♂, 2 imm. ♂, 3 ad. ♀.

These specimens, the dark as well as the light ones, differ from specimens of nominate *coelebs* from northern Europe by the color of their mantle, which is less chestnut, duller, and darker; and by the darker color of their cheeks and under parts which is vinaceous brown rather than pinkish brown.

The three adult males from Kherat (one on July 27 and two on September 30) match perfectly another adult male taken much farther east at Turbat i Haidari on September 10. These four specimens are distinctly paler than the seven males from Gozlu, Karimserai, and Dimalu. They have a similar vinaceous tinge, but the color is not so deep and the brown of the mantle is not so dark. All these birds have started to moult, but the moult is not advanced, and they are still in worn plumage. The other two males from Turbat i Haidari are no longer in comparative plumage, as the moult is about finished.

Adult females in worn plumage also show a difference. The female from Kherat and four from Khorasan are slightly paler and not so brown on the mantle as the three females from Ahangarmahali, Gozlu, and Dimalu. The other two Khorasan adult females are finishing the moult and are in fresh plumage.

Although I have no specimens in fresh winter plumage from the region of Gurgan, and specimens from Mazenderan from farther west than Gurgan unfortunately are not available, the evidence

given above suggests that two distinct forms breed in Persia. They apparently meet in the region of Gurgan, the darker form ranging from Gurgan westward along the wet zone of the southern Caspian, the paler one eastward into the much drier mountains of Khorasan.

The material examined is insufficient, but if additional specimens should support this division, the name *F. c. transcaspia* is available for the paler race, a *pale* first year bird collected in the Kopet Dagh in northern Khorasan having been described under this name by Zarudny and Bilkevitch. For the time being, the name *F. c. alexandrovi* can be used for both the western and eastern populations, the type locality of *alexandrovi* being the "Province of Astrabad" (now Gurgan) from which I have breeding specimens of both.

MOULT: As stated, adults begin to moult towards the middle or end of July, the moult being practically over in some specimens from early September.

MEASUREMENTS: In the dark form, the bill in seven adult males measures 13.5–15.5 (14.40), and in three adult females 13.5–14.5 (14.0). In the adults of the light form, six males measure 13.5–14.5 (14.10) and seven females 12.5–14.0 (13.20). The wing and tail feathers in both forms are either badly worn or moulting, the measurements, however, appearing to be similar.

***Fringilla montifringilla* Linnaeus**

PERSIA: Azerbaijan: Gharibdash, October 25, 1940, 1 imm. ♂; Ardebil November 3–4, 2 ad. ♂, 1 ad. ♀, 1 imm. ♀; Namin, November 6, 2 ad. ♂; Sarab, November 8, 1 ad. ♂, 1 ad. ♀; Livan, November 14–19, 1 imm. ♂, 1 ad. ♀; Maraghe, November 25–27, 1 ad. ♂, 1 ad. ♀; Rezaieh, December 7, 1 ad. ♀. Iran: Hamadan, December 21, 2 ad. ♂; Karaj, January 20, 1944, 1 ad. ♂, February 1, 1945, 1 ad. ♀, December 10, 1 ad. ♀. Kermanshah: Kermanshah, January 14, 1941, 2 ad. ♂, 4 ad. ♀. Luristan: Durud, February 27–March 20, 3 ad. ♂, 1 ad. ♀. Kirman: Balvard, December 31, 1939, 1 ad. ♀; Mohamedshah, January 7, 1940, 1 ad. ♂; Dehishib, January 17, 1 ad. ♂.

AFGHANISTAN: Kang, November 5, 1937, 1 imm. ♂; Bala Murghab, November 15, 1 ad. ♀; Maimana, November 16–18, 3 ad. ♂, 1 imm. ♂, 2 ad. ♀; Mazar i Sharif, December 5, 1 ad. ♂, 1 ad. ♀; Balkh, November 28, 1 ad. ♂, 1 ad. ♀, December 1, 1 ad. ♂, October 29–31, 1939, 2 ad. ♂, 2 ad. ♀; Burchao Pass, October 12–14, 2 ad. ♂, 1 ad. ♀.

All the specimens are in fresh winter plumage, the first signs of wear appearing in birds taken from the middle of January onward.

MEASUREMENTS: Wing, 26 males, 88.0–97.0 (92.20); 21 females, 82.0–91.0 (87.20). Tail, 25 males, 57.0–66.0 (61.50); 22 females, 52.0–62.0 (57.10). Bill, 24 males, 13.5–15.0 (14.20); 22 females, 13.0–14.5 (13.80).

Serinus pusillus Pallas

PERSIA: Kirman: Mohamedshah, January 7, 1940, 1 imm. ♂. Yezd: Shir Kuh, February 22–23, 3 ad. ♂, 1 ad. ♀. Iran: Karaj, April 1–7, 1943, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀. Bakhtiari: above Tale, May 3, 1940, 2 ad. ♂, 1 ad. ♀; Kalvar, May 30, 1 ad. ♂; Ti, May 31, 1 ad. ♂. Luristan, Khali Kuh, June 1, 4 ad. ♂, 3 ad. ♀; Durud, October 29–November 5, 1941, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀. Mazenderan (region of Gorgan): Shah Kuh, July 16 and 20, 1940, 2 ad. ♂; Rubatkarim, July 16, 1 ad. ♀; Dimalu, July 16, 2 imm. ♂, 1 imm. ♀; Karimserai, July 21, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀. Khorasan: Kotaliyekchinar, August 3, 1 imm. ♂; Bardu Forest, August 20, 1 ad. ♂; Shahrud, September 27, 1 imm. ♂. Azerbaijan: Livan, November 19, 1 imm. ♀.

AFGHANISTAN: Sirotai, June 17–18, 1937, 4 ad. ♂, 3 ad. ♀; Tirgaran, July 19, 1 ad. ♂; Zebak, July 21, 1 ad. ♂; Sanglich, July 26–27, 2 ad. ♂; Iskarzir, July 31, 1 imm. ♀; Lorinj, July 26, 1939, 1 ad. ♂; Terak, September 25, 1 ad. ♀; Safedsang, September 20, 2 imm. ♀; Gurzan, October 5–6, 4 imm. ♂, 2 ad. ♀, 6 imm. ♀, 1 unsexed imm.; Burchao Pass, October 12, 1 ad. ♀; Kabul, November 13–15, 4 ad. ♂, 1 unsexed imm.

NORTHERN INDIA: Northern Punjab, Lahul: Kolung, August 10, 1936, 1 imm. ♂, 1 ad. ♀. Kashmir, Baltistan: Sodpur, August 10, 1936, 1 ad. ♀, 1 imm. ♀; Skardo, August 13, 2 ad. ♂; Shrigar Nulla, August 21, 1 ad. ♀; upper Tale Valley "10,000 feet," 1 imm. ♂; Chulunka, September 2, 1 ad. ♂; Udmara, September 6, 1 ad. ♂; Hundi, September 7, 1 imm. ♂; Deskit, September 11, 1 ad. ♂; Karsa, September 11–12, 1 imm. ♂, 1 ad. ♀; Karzong, September 13, 1 imm. ♂.

A large series of 155 specimens was examined from all parts of the range except Tibet. It consists of seven specimens from the Caucasus, taken not far from the type locality, 43 from all parts of Persia, three from Transcaspia, 35 from Afghanistan, 19 from Russian Turkestan (two from Ferghana and the rest from the Tian Shan), one from the Altaï, two from Gilgit, nine from northern Punjab, and 36 from Ladak and Baltistan in Kashmir. Every stage of plumage is represented, except in the specimens from the Caucasus which are in fresh plumage, and those from northern Punjab and Kashmir which are in worn plumage. The Tian Shan series is about equally divided.

In specimens in fresh plumage, the Caucasus birds are a little darker on the upper parts than specimens from Persia, Afghanistan, and Tian Shan, the Persian specimens averaging palest. The Persian and Afghanistan specimens are more sooty, not so black

on the sides of the head and on the throat as the specimens from the Caucasus and Tian Shan. I can see no differences as regards the coloration of these parts in the last two.

In worn plumage, some of the specimens from Tian Shan, but by no means all of them, are a little blacker on the sides of the head and throat, less sooty than in my other worn specimens from all the other parts of the range; as stated, worn specimens from the Caucasus are lacking. There are no other apparent differences.

Meinertzhagen's specimens from Tian Shan (1927, *Ibis*, p. 380) had the red of the forehead a little deeper and of greater extent. In my specimens this character does not seem to vary geographically. There is a certain degree of variation, but the variation is individual. The shade of the color is affected by wear, the most worn specimens being the most bleached. In the fresh specimens, some of the individuals in all the sizable populations will have the color a little more golden or a little redder.

As shown below, the measurements of adult males are practically identical in all the various regions, and I agree with Meinertzhagen (*loc. cit.*) that "there is no character sufficiently constant in any area to justify separation," a conclusion also reached independently by Hellmayr (1929, *Field Mus. Nat. Hist.*, zool. ser., vol. 17, no. 3, p. 46).

MOULT: In my specimens, the complete post-nuptial moult of the adult starts towards the middle of July (northern Persia and Afghanistan), and is about over in these two regions by the end of October. Juvenal specimens from late September and early October in these two regions are moulting into first year plumage; in this plumage the birds have the throat blackish and the breast is striped, but the sides of the face and crown are brownish as in the juvenal plumage.

MEASUREMENTS: Adult males only; very worn or moulting specimens are not included:

Region	N	Wing	N	Tail	N	Bill
Caucasus	4	75.5-79.0 (76.90)	4	51-53 (52.00)	4	9.0-9.5 (9.10)
Persia	13	72.0-77.5 (74.90)	12	47-56 (51.50)	20	8.5-10.0 (9.20)
Transcaspia	1	73.5 — —	1	51 — —	1	9.5 — —
Afghanistan	9	74.0-77.0 (76.30)	10	48-56 (52.20)	12	8.5-10.0 (9.25)
Kashmir	9	74.0-77.5 (76.00)	4	48-54 (50.50)	17	8.2-10.0 (9.00)
Ferghana	2	75.5, 79.0 —	2	50, 55 —	2	9.0, 9.5 —
Tian Shan	12	74.0-81.0 (76.80)	12	49-56 (52.10)	12	8.5-10.0 (9.00)

***Serinus canaria serinus* Linnaeus**

WESTERN PERSIA: Kermanshah: Qasr i Shirin, January 6, 1941, 1 ad. ♂, 1 ad. ♀.

These two specimens constitute the easternmost record for the species. In his distributional list of the birds of Persia, Zarudny (1911, Jour. Ornith., vol. 59, p. 214), lists a *Serinus* (other than *pusillus*) as nesting in the Zagros Mountains. The author may have meant *Serinus canaria*, but, since he gives his record with a question mark and does not identify the species, my two birds appear to be the first definite record for Persia. Hitherto, the most eastern record seems to have been in the Caucasus where the bird is said to have occurred accidentally.

***Carduelis spinus* Linnaeus**

PERSIA: Mazenderan (region of Gurgan): Dimalu, July 24, 1940, 2 ad. ♀. Iran: Hamadan, December 23, 1 ad. ♀.

These specimens are indistinguishable from specimens from northern Europe. The two July birds are in full moult. In the December bird the wing measures 70, and the tail 42. The bill in the three specimens measures 11, 11.5, 12.

***Carduelis chloris turkestanicus* Zarudny**

SYNONYMS: *Chloris chloris bilkevitchi* Zarudny.

Chloris chloris smithae Koelz.

Collected during the breeding season (July 11-27):

PERSIA: Mazenderan: Gurgan, July 11, 1940, 1 imm. ♀; Ahangarmahali, July 14, 1 imm. ♀; Karimserai, July 20-21, 1 imm. ♂, 1 ad. ♀, 4 imm. ♀; Dimalu, July 23, 2 ad. ♂, 1 ad. ♀; Kherat, July 27, 1 ad. ♂, 2 imm. ♂.

Collected outside the breeding season (September 30-January 10):

PERSIA: Mazenderan: Gurgan, September 30, 2 ad. ♂, 1 imm. ♂, 2 ad. ♀, 1 imm. ♀. Azerbaijan: Ardebil, November 2-4, 5 ad. ♂; Namin, November 5-6, 7 ad. ♂, 3 ad. ♀, 2 imm. ♀; Sardarud, November 23, 1 ad. ♀; Maraghe, December 1, 1 ad. ♂; Saujbulagh, December 3, 2 ad. ♂; Khoi, December 11, 5 ad. ♂, 3 ad. ♀, 1 imm. ♀. Kermanshah: Qasr i Shirin, January 4, 1941, 1 ad. ♂; Surkhidizeh, January 10, 2 ad. ♂.

AFGHANISTAN: Balkh, December 1, 1937, 1 ad. ♂ (the type of *C. c. smithae*), 1 ad. ♂, 2 ad. ♀.

Of the specimens collected during the breeding season, the plumage of the adults is too badly worn to be used in color comparison. The immatures are grayer, less olive, paler both above and below than immature specimens of *C. c. chloris* from western

Europe and *aurantiiventris* from southern Europe and north Africa. My immatures of these last two races are indistinguishable from one another, and a single immature specimen of *chlorotica* (Syria and Palestine) is identical to the immatures from Mazenderan.

The other specimens taken in winter in Persia and Afghanistan are in fresh plumage. As a series, the adults are a little paler, less olive and less brownish, have the yellow edges of the wing very slightly paler, and are grayer on the nape than comparative specimens of nominate *chloris*; they are less bright and are less suffused with yellow than *chlorotica*, and are less golden below than *aurantiiventris*; these last two are also smaller.

Zarudny stated that *bilkevitchi* is like *turkestanicus* but smaller. The measurements that he supplies (1911, Messenger Ornith., p. 298) show that there is a small difference in average, 67 males of *turkestanicus* having a wing length of 98.2–87.5 (91.96), as against 91.0–85.0 (88.12) for 11 males of *bilkevitchi*. However, all but three of the individual measurements of *bilkevitchi* fall within the range of variation of *turkestanicus*. The original series of *bilkevitchi* was collected from January 4 to February 9 in the Achal-Tekkes region on the border of northern Khorasan, and the 67 males of *turkestanicus* were collected in every month of the year in the region of Tashkent in Turkestan. In my male specimens collected during the breeding season in a region (Gurgan and vicinity) not far removed from the Achal-Tekkes, the wing measures 88, 89, 89, but these specimens have the wing tips badly worn off. Stresemann (1928, Jour. Ornith., vol. 76, p. 348) gives the wing length of two males, collected on July 13 and 23 in Mazenderan, as 88 and 92. Although these five measurements, which also fall within the range of variation of *turkestanicus*, may be insufficient, they strongly suggest that there is probably no significant size difference between the breeding birds of Turkestan and Persia.

The four specimens collected at Balkh on December 1, 1937, and upon which *smithae* is based (1939, Proc. Biol. Soc. Washington, vol. 52, p. 74) constitute the first and only record of the species in Afghanistan. The type is an unusually brown bird, but the other male is paler, grayer, and lacks the brownish tinge of the type. When compared to the winter specimens from Persia, the type can be matched by two or three of these specimens, and the paler male is identical to the rest of the males in the series. The

two Balkh females are identical to the Persian females. The other characters given by the author, such as the intensity of the yellow on the body or on the edges of the primaries, are also matched repeatedly by the Persian birds. As the Balkh specimens were taken in winter, the possibility that these birds are winter visitors from farther north cannot be overlooked.

MOULT: In the July specimens from Mazenderan, three of the adults and three of the juvenals are beginning to moult, in the adults the moult is complete, in the juvenal only the body feathers are moulting.

***Carduelis spinoides spinoides* Vigors**

NORTHERN INDIA: Northern Punjab, Kulu: Koti, June 5, 1936, 2 ad. ♂. Northern Punjab, Chamba: Kukti, July 3, 1 ad. ♂. Northern Punjab, Lahul: Kyelang, June 11, 1 ad. ♂; Kolang, June 20, 1 ad. ♂; Tirting, June 30, 1 ad. ♂, 1 ad. ♀; Tsambek, July 1, 1 ad. ♂; Gumrang, October 18, 1 imm. ♂. Northern Punjab, Kangra: Kotla, February 3, 1946, 1 ad. ♂. Nepal: Chitlang, March 14–April 19, 1947, 1 ad. ♂, 2 ad. ♀, 1 imm. ♀; Thankot, March 29–April 12, 3 ad. ♂, 4 ad. ♀, 1 imm. ♀.

All the specimens from Nepal are in worn plumage, and those from northern Punjab are, with one exception, in fresh plumage. There appears to be, however, no differences in coloration between the two series, as the worn specimen from northern Punjab (Kotla, February 3) is identical with the Nepal birds. The distribution of the black on the cheeks and of the white on the tips of the secondaries is similar in both series.

Carduelis ambiguus Oustalet from northern Burma, Yunnan, and Szechwan is treated as a separate species by Mayr (1941, Ibis, p. 361). This bird has the white tips on the secondaries of *spinoides* but has solid black cheeks and is very different in the coloration of the back and under parts. Delacour's *monguilloti* from Annam is again very different; it has the solid black cheeks of *ambiguus* but lacks the white on the secondaries of *spinoides* and *ambiguus*. All these forms are geographical representatives, and while they may be more conveniently treated as separate species, there is no doubt that they are parts of one superspecies.

Two recently described forms, neither of which was available, are: *taylori* Kinnear (1939, Ibis, p. 752) from southeastern Tibet, and *heinrichi* Stresemann (1940, Mitteil. Zool. Mus. Berlin, vol. 24, no. 2, p. 170) from Mt. Victoria. According to the de-

scription, *taylori* appears to be similar to *ambiguus* but is paler, and below the yellow color does not extend so far down; the other, *heinrichi*, has solid black cheeks but is treated by its author as a race of *spinoides* to which it is said to be closer.

MOULT: The adult specimens taken in Nepal from April 1 to 19 are just starting a complete moult. This moult is in its very last stages or just over in the northern Punjab birds, taken from June 5 to July 3. This might lead to the conclusion that this species breeds unusually early, if Whistler (1940, Ibis, p. 151) had not shown that the breeding season is in July and August, and that in this species, unlike almost all other Passeres, the complete annual moult is prenuptial rather than post nuptial. Whistler also states that, through another peculiarity, the juvenal plumage is not changed after the breeding season but is retained throughout the winter as the first year plumage, to be changed late in the spring by a complete moult into the adult breeding dress. In my three immature specimens, the October 18 bird from Lahul and the March 29 bird from Nepal are in juvenal plumage. The other specimen, taken on April 16 in Nepal, is just beginning to moult, starting with the feathers of the under part of the body, the new feathers being the bright yellow feathers of the adult.

MEASUREMENTS: Badly worn specimens or those in which the feather does not appear to be fully grown excepted.

Northern Punjab: Wing, seven males, 78–81 (79.30); one female, 77. Tail, six males, 43.5–50.0 (46.10); one female, 45. Bill, eight males, 12.5–13.5 (13.0); one female, 13.0. Nepal: Wing, two males, 79, 81; three females, all 77. Tail, one male, 48; three females, 43–47 (45.0). Bill, four males, 12.5–13.5 (12.80); five females, 12.5–13.5 (12.90).

THE GOLDFINCH

The large series of the Goldfinch collected by Koelz consists of 92 specimens of the black-headed group (*Carduelis carduelis*) and 120 of the gray-headed group (*Carduelis caniceps*). Of the 212 specimens, 131 are from Persia, 72 from Afghanistan, and nine from Kashmir and northern Punjab. This material was studied together with that of the American Museum of Natural History. The ranges or parts of the ranges of the races discussed or mentioned in this study are shown in figure 1.

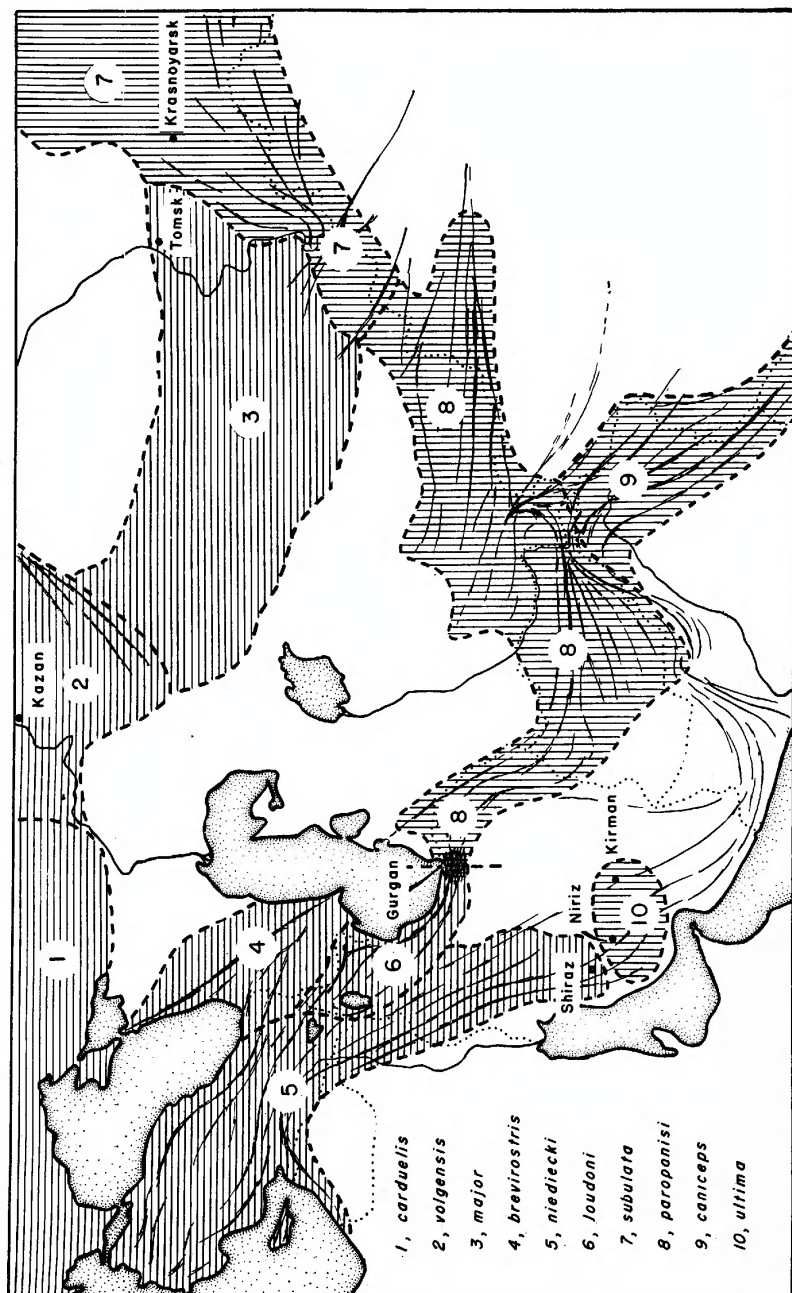


FIG. 1. Distribution of *C. carduelis* in western Asia. Horizontal lines: black-headed races; vertical: gray-headed.

CARDUELIS CARDUELIS GROUP

Carduelis carduelis loudoni Zarudny, 1906

TYPE LOCALITY: Gilan and Kazvin, northern Persia.

In Persia, a dark race (*loudoni*) is found in Azerbaijan and in the mountains along the southern shore of the Caspian as far east as the region of Gurgan. This dark race is resident as shown by the specimens of Stresemann (1928, Jour. Ornith., vol. 76, p. 348) and Paludan (1940, Danish scientific investigations in Iran, pt. 2, p. 30, Einar Munksgaard, Copenhagen). Paludan's specimen, which was collected on July 29 at Firuzkuh, was on its breeding grounds as its gonads were well enlarged. Stresemann's specimens, which were collected on July 13 between Sari and Gurgan, agreed perfectly with five March specimens from Kumbaschinsk in Talych. I have examined five specimens collected in late March at the same locality (perhaps the same specimens examined by Stresemann), which match perfectly the dark specimens collected by Koelz in Azerbaijan.

Carduelis carduelis brevirostris Zarudny, 1889

TYPE LOCALITY: Baku.

At the same time (November 8 to 28) and at the same localities in Azerbaijan, Koelz collected a number of specimens that are distinctly paler than those of *loudoni*. Above and on the breast, *loudoni* is earth brown (varying from bistre to umber) rather than grayish brown on the back and rusty on the breast as in the paler specimens. In *loudoni* the brown pigment on the breast extends over a greater area, and there is less white on the rectrices. The white patches on the two outer pairs of rectrices average smaller, and the third pair usually has no white spot. In my specimens of *loudoni* this white spot is lacking on the third pair in 19 out of 22 specimens of both sexes, juvenal as well as adults, whereas in the paler birds this spot is present in eight out of 11 specimens.

Stresemann's specimens of *loudoni* differed from specimens from the Terek Mountains in the northern Caucasus by having the sides of the breast dark earth brown rather than rusty, and Zarudny contrasted the birds he described under that name to a paler "gray-brown" race with more restricted distribution of pigment on the breast. This last race Zarudny called *C. c. minor*, which is a mere redescription under a new name of his earlier

brevirostris. Therefore I believe, although I have not examined specimens from the Caucasus, that my pale Azerbaijan birds are migrant *brevirostris*.

***Carduelis carduelis niediecki* Reichenow, 1907**

TYPE LOCALITY: Eregli, Asia Minor.

SYNONYM?: *Carduelis carduelis iranensis* Zarudny, 1913; type locality, Zagros Mountains from Kurdistan to Laristan.

The rest of the specimens of *C. carduelis* collected by Koelz were taken in the Zagros Mountains, from Qasr i Shirin in Kurdistan to Shiraz in Fars, and three were taken at near-by Isfahan. Of these, the birds of Fars, Bakhtiari, and Chamchid in Luristan (paragraph A of the list of specimens) were collected while breeding or during the breeding season (April 8 to June 6), and agree with three breeding specimens of *niediecki* from Syria and Palestine (April 9 to June 8). All these breeding specimens are in worn plumage; above they are paler than my *brevirostris* from Azerbaijan, but the difference is probably due to wear. However, there are certain differences which cannot be explained by wear: in the breeding birds the breast patches are smaller, the rusty color does not extend so far down on the flanks, and in 10 out of 22 specimens there is yellow pigment on the breast.

Paludan (1938, Jour. Ornith., vol. 86, p. 592) calls his three May specimens from the Zagros *C. c. iranensis* Zarudny, because the specimens of *niediecki* that he has examined from Eregli and Taurus seemed to be marked with more yellow on the breast. Two specimens from Eregli that I have examined had no yellow on the breast. However, these birds were collected on October 19 and November 12, and I cannot be sure that they were residents. Neither Paludan nor I have had enough comparative material to decide this question, and I use *niediecki* since it is the older name.

My winter birds from the Zagros (paragraph B of the list of specimens) appear to be a mixed series. Above, these specimens, which are all in fresh or slightly worn winter plumage, are inseparable from my *brevirostris* from Azerbaijan, and about half of the specimens have the breast patches identical in color and size. In the other specimens, these patches are smaller and paler, and a few have traces of yellow. However, there are all kinds of gradation in the size and color of the breast patches, and I cannot with

certainly separate all the specimens. I have listed all the winter specimens under *niediecki*.

The measurements of the Koelz specimens given at the end of the discussion show that *loudoni* is slightly larger than my breeding *niediecki* from the Zagros. The measurements of *brevirostris* are too few, but this race may also be larger than *niediecki*.

Carduelis carduelis volgensis Buturlin, 1906

Carduelis carduelis major Taczanowski, 1874

TYPE LOCALITIES: Of *volgensis*, Promzino, Simbirsk Gouvernement, south-eastern Russia; of *major*, Turkestan.

In Persia, *volgensis* is said to occur as a winter visitor, and *major* may rarely do so. Specimens of these two races that I have examined show that *major* is a large pale bird with an almost pure white rump, the wing in nine males measuring 83–90 (86.67), and that *volgensis* is a little smaller but larger than *C. c. carduelis*, the wing in Buturlin's five males measuring 82.5–85.5 (83.60) and in 12 males of nominate *carduelis* from western Europe that I have measured, 76–82 (78.75). No male specimens of *volgensis* were available. The female specimens examined were intermediate in size and color between females of *major* and nominate *carduelis*; they had more white on the rump than in nominate *carduelis* but less than in *major*, and on the back were less dark than in nominate *carduelis* but more rufous than in *major*. No specimens of either *volgensis* or *major* were collected by Koelz.

CARDUELIS CANICEPS GROUP

The black-headed races reach their eastern limits and are replaced by the gray-headed races in the following regions: the region to the east of Tomsk south to the central Altaï, along the course of the Katun River, to the western Tarbagataï; the region of Gurgan at the southeastern corner of the Caspian; and the region between Shiraz and Niriz in southeastern Fars. In the first of these regions the two groups meet. Sachtleben in his review of the Goldfinch (1918, Archiv. Naturgesch., div. A, vol. 84, no. 6, p. 148) gives a number of references showing that hybrids are common, and Johansen (1944, Jour. Ornith., vol. 92, p. 35) states that in certain parts the entire population shows signs of hybridization. In the region of Gurgan the two groups also meet, and Koelz collected two hybrids, an adult male taken on July 20 at Shah Kuh

and an adult female on July 24 at Dimalu, the rest of the series from this region being the typical gray-headed form. In southeastern Fars the two groups may be separated by an unknown gap. At Shiraz two breeding specimens taken on March 16 are typical *carduelis*, and a specimen taken while nesting at Niriz on March 29 is a typical *caniceps*.

A number of gray-headed races have been described, and since in some cases discrimination has been based on size, the individual measurements of the adult male specimens I have examined are given below. Specimens in which the primaries were very worn are not included, and those in which the tip of the feathers is partly worn are followed by a plus sign; in computing the average, 1.5 mm. were added for each plus sign.

Winter migrants taken in Turkestan: Wing, 81, 82.5, 82.5, 83.5, 83.5, 84, 84, 85, 87.5 (83.70). Bill, 16.5, 17, 17, 18, 18, 18, 18.5, 18.5, 19 (17.73).

Tarbagatai (April), Altaï (May 12): Wing, 82, 83, 86 (83.66). Bill, 17, 17.5, 18 (17.50).

Tian Shan, south of Issyk-Kul (September 4 to 9), Przhevalsk (September 22 to 25): Wing, 82.5, 82.5, 83+, 84+ (83.75). Bill, 16.5, 17, 18, 19 (17.62).

Eastern Afghanistan (June 20 to July 21): Wing, 80, 80, 81, 82, 83, 83+, 84.5, 85 (82.50). Bill, 17, 17, 17.5, 18, 18, 18, 18.3, 19 (17.80).

Western Afghanistan (September 2 to October 15): Wing, 80, 81, 81, 82, 82, 82, 82, 83, 83, 83, 83.5, 84, 85 (82.40). Bill, 16, 16.5, 17, 17, 17, 17, 17, 17.5, 17.5, 17.5, 18, 18, 18, 18, 18, 18.3, 18.5, 18.5, 19, 19 (17.65).

Khorasan (August 2 to 19): Wing, 80+, 80+, 81+, 82+, 83, 84, 84+ (83.16). Bill, 17, 17, 17.5, 17.5, 18, 18, 18, 18.5, 19.5 (17.89).

Near Gurgan (July 20 to 21): Wing, 79.5, 83+ (82.0). Bill, 18, 18.

Fars and Kirman (January 30 to March 29): Wing, 83, 83, 83, 84.5, 85, 85 (83.92). Bill, 18.5, 19, 19.5, 20, 20, 20 (19.50).

Kashmir and northern Punjab (April 11 to August 13): Wing, 77+, 80, 80, 81, 81, 82, 83, 83.5 (81.0). Bill, 16, 16.5, 16.5, 16.5, 17, 17, 17.5, 18 (16.88).

It can be seen that with the exception of the Himalayan birds which are very slightly smaller and have a shorter bill and those of Fars and Kirman which have a longer bill, there are no significant

differences in size between the various populations. There are, however, differences in coloration. The following races of the gray-headed group can be recognized.

***Carduelis carduelis caniceps* Vigors, 1831**

TYPE LOCALITY: Simla.

This race, in addition to having the shortest bill and somewhat shorter wing measurements, is the darkest of all; its back is brownish gray, and below it is heavily and broadly stained with the same color.

***Carduelis carduelis subulata* Gloger, 1833**

TYPE LOCALITY: Yenissei.

SYNONYM: *Carduelis caniceps poliakovi* Sushkin, 1925; type locality, Yary on the Bukhtarma River, southern Altaï.

Dementiev (1934, L'Oiseau, p. 94) states that in winter *subulata* migrates to Turkestan and that *paropanisi* (the resident race of Turkestan and Tian Shan) drops to the south. I have not examined breeding specimens of *subulata*, but a good series taken in winter at Djarkent in Turkestan shows that this race is noticeably bigger and considerably paler than *caniceps*. Above, *subulata* is lighter gray, almost pale ashy or with pale yellowish brown wash, and there is more white on the rump and less gray on the breast.

The southern Altaï and Tarbagataï population has been described as *poliakovi* by Sushkin. This race is said to have the sides of the head and of the body darker, and to have the gray color of the back extending farther onto the rump than in *subulata*. A May specimen from Uimon "Altaï" and two April specimens from the Zaisan district are identical with my specimens of *subulata*. Uimon was not located, but Zaisan is in the Tarbagataï. These three specimens are insufficient, and it is possible that the birds breeding from the Tarbagataï north into southern Altaï are slightly darker than those breeding farther north. However, the difference between the birds breeding south of the Tarbagataï (*paropanisi*) and those north of the southern Altaï (*subulata*) is too small to warrant, I believe, the recognition of an intervening population.

***Carduelis carduelis paropanisi* Kollibay, 1910**

TYPE LOCALITY: Naryn, Tian Shan.

SYNONYM: *Carduelis caniceps subcaniceps* Zarudny, 1916; type locality, Kopet-Dagh, northern Khorasan.

This race is intermediate in coloration between *caniceps* and *subulata*. I have examined a series of *paropanisi* from the Tian Shan consisting of five adults and six immatures collected from September 4 to 9 at Barskoun, south of the Issyk-Kul, and September 22 to 25 at Karakol (Przhevalsk). The adults are in the last stages of the moult, and their body plumage is fresh, or almost so; the immatures are in worn juvenal plumage. The immatures are inseparable from my other immature specimens from Afghanistan, Khorasan, and the region of Gurgan. My adults from these last two regions are badly worn and cannot be compared to the Tian Shan birds; in this worn plumage they are identical to the worn adults from Afghanistan. The fresh specimens from Tian Shan are identical with specimens in comparative plumage taken at the same time of the year in eastern and western Afghanistan.

The populations from Gurgan and Khorasan to the Pamirs were called *subcaniceps* by Zarudny. According to Hartert (1921, *Vögel paläarktischen Fauna*, vol. 3, p. 2051), the only character that supposedly distinguishes *subcaniceps* from *paropanisi* is its smaller size. The list of individual measurements given above shows that none of the populations from Gurgan to Tian Shan are separable on size, and, as I have discussed, there is apparently no difference in coloration.

***Carduelis carduelis ultima* Koelz, 1949**

TYPE LOCALITY: Niriz, southeastern Fars.

This isolated race (1949, *Auk*, vol. 66, p. 208) of the gray-headed group differs from all the others by the greater length of its bill. As a series, the specimens of *ultima* are slightly paler above and have slightly less gray on the flanks than specimens of *paropanisi* in comparative plumage. Some specimens of *ultima* (the type and four others) are almost as pale on the back as my specimens of *subulata*. These, however, are very fresh, and as all my specimens of *ultima* are somewhat worn, this similarity may be due to wear.

Actually, of course, this long-billed race of the gray-headed group is separated from *subulata* by an enormous amount of intervening territory, and just as effectively from *paropanisi* by the great deserts of central and southeastern Persia and southern Afghanistan. The type of *ultima* is a breeding bird collected while nesting at Niriz on March 29.

MEASUREMENTS OF THE KOELZ SPECIMENS OF *Carduelis carduelis*^a

loudoni, Azerbaijan:

Wing: 9 ♂, 80.0–85.0 (81.66); 8 ♀, 76.5–83.0 (79.06)
 Tail: 9 ♂, 48.0–56.0 (50.67); 8 ♀, 45.5–53.0 (48.81)
 Bill: 8 ♂, 15.0–16.0 (15.70); 8 ♀, 14.0–15.0 (14.67)

brevirostris, Azerbaijan:

Wing: 4 ♂, 80.0–82.0 (80.75); 3 ♀, 76.0–79.0 (77.34)
 Tail: 4 ♂, 48.0–50.0 (48.50); 3 ♀, 46.0–51.0 (48.33)
 Bill: 4 ♂, 14.5–16.0 (15.40); 3 ♀, 14.5–15.5 (14.83)

niediecki, Zagros Mountains (breeding or collected during breeding season):

Wing: 14 ♂, 77.0–84.0 (80.61); 8 ♀, 77.0–80.0 (79.00)
 Tail: 14 ♂, 46.0–52.0 (47.73); 8 ♀, 46.0–50.0 (47.35)
 Bill: 14 ♂, 14.0–15.0 (14.50); 8 ♀, 13.0–14.5 (13.65)

niediecki, Zagros Mountains (collected from September 12 to March 29):

Wing: 15 ♂, 77.5–83.0 (80.53); 16 ♀, 75.0–78.0 (76.63)
 Tail: 14 ♂, 45.0–52.0 (48.28); 18 ♀, 44.5–50.5 (46.90)
 Bill: 14 ♂, 13.5–15.5 (14.35); 18 ♀, 13.0–15.0 (13.90)

caniceps, northern Punjab and Kashmir:

Wing: 4 ♂, 81.0–83.5 (81.88); 1 ♀, 80.0
 Tail: 5 ♂, 46.0–50.5 (48.50); 3 ♀, 46.5–49.0 (47.83)
 Bill: 5 ♂, 16.0–18.0 (17.00); 3 ♀, 16.0–17.0 (16.67)

paropanisi, Gurgan region and Khorasan:

Wing: 3 ♂, 79.5–84.0 (82.16); 2 ♀, 77.5, 80.5 (79.00)
 Tail: 4 ♂, 49.0–52.0 (50.75); 2 ♀, 49.0, 50.0
 Bill: 11 ♂, 17.0–19.5 (17.73); 5 ♀, 15.0–18.5 (16.10)

paropanisi, western Afghanistan (September 2 to October 15):

Wing: 14 ♂, 80.0–85.0 (82.40); 11 ♀, 76.0–81.0 (80.63)
 Tail: 11 ♂, 46.0–54.0 (50.04); 13 ♀, 46.0–51.0 (49.14)
 Bill: 22 ♂, 16.0–19.0 (17.65); 17 ♀, 16.0–17.5 (16.53)

paropanisi, eastern Afghanistan (June 20 to July 21):

Wing: 8 ♂, 80.0–85.0 (82.50); 3 ♀, 79.0–81.0 (80.00)

^a Adults only; badly worn specimens are not included.

Tail: 6 ♂, 48.0–52.5 (49.85); 3 ♀, 47.0–49.0 (48.33)
Bill: 8 ♂, 17.0–19.0 (17.80); 3 ♀, 16.5–17.0 (16.84)

paropanisi, eastern Afghanistan (Kabul, November 15–20):

Wing: 2 ♂, 81.5, 82.0; 6 ♀, 78.5–81.0 (79.75)
Tail: 2 ♂, 47.0, 49.0; 5 ♀, 47.0–51.0 (49.20)
Bill: 2 ♂, 17.5, 19.0; 8 ♀, 16.5–18.0 (17.25)

ultima, southeastern Iran, Kirman, and Fars:

Wing: 6 ♂, 83.0–85.0 (83.92); 3 ♀, 80.0–85.0 (81.70)
Tail: 6 ♂, 51.0–54.0 (52.50); 3 ♀, 47.0–52.0 (49.33)
Bill: 6 ♂, 18.5–20.0 (19.50); 3 ♀, 18.8–19.0 (18.93)

***Carduelis carduelis loudoni* Zarudny**

PERSIA: Azerbaijan: Ardebil, November 2–4, 1940, 4 ad. ♂, 1 imm. ♂, 6 ad. ♀, 2 imm. ♀; Namin, November 6, 1 ad. ♀; Sarab, November 9, 2 ad. ♂, Livan, November 14–15, 2 ad. ♂; Tabriz, November 23, 2 imm. ♀; Maraghe; November 27, 1 ad. ♀; Khoi, December 11, 1 ad. ♂.

***Carduelis carduelis brevirostris* Zarudny**

PERSIA: Azerbaijan: Sarab, November 8–9, 1940, 2 ad. ♀, 1 imm. ♀, 1 unsexed imm.; Livan, November 19, 1 ad. ♂, 1 ad. ♀; Tabriz, November 23, 1 ad. ♂; Maraghe, November 26–28, 2 ad. ♂, 2 imm. ♀.

***Carduelis carduelis niediecki* Reichenow**

A. Collected while breeding or during the breeding season:

PERSIA: Fars: Shiraz, March 16, 1940, 1 ad. ♂ "testes enlarged," 1 ad. ♀ "ova swelling"; Dasht i Arjan, April 8–9, 2 ad. ♂, 4 ad. ♀, all "mated or gonads enlarged"; Kazerun, April 11, 1 ad. ♀ "mated." Bakhtiari: April 30–May 10, 4 ad. ♂, all "nesting or breeding"; Ti, May 30–June 4, 1 ad. ♂, 1 ad. ♀ "laying." Luristan: Chamchid, May 26–June 6, 6 ad. ♂, 1 ad. ♀.

B. Collected from September 12 to March 29:

PERSIA: Iran: Isfahan, March 3–4, 1940, 3 ad. ♀. Kermanshah: Kermanshah, December 25, 1 unsexed ad.; Shahabad, December 27, 4 ad. ♂, 2 imm. ♂, 6 ad. ♀, 1 imm. ♀, 1 unsexed ad.; Qasr i Shirin, December 29–January 6, 1941, 2 ad. ♀. Luristan: Durud, January 22–24, 2 ad. ♂, March 2–29, 7 ad. ♂, 4 ad. ♀, September 12–15, 1 ad. ♂, 2 ad. ♀. Bakhtiari: Imarat, February 17, 1 ad. ♂.

***Carduelis carduelis caniceps* Vigors**

NORTHERN INDIA: Northern Punjab, Lahul: Sisu, June 8, 1936, 1 ad. ♀; Kolung, June 14, 1 ad. ♂; Tisting, June 30, 1 ad. ♂. Northern Punjab, Kulu: Kulu, November 10–11, 2 ad. ♀. Kashmir: Gurais, August 3, 1 ad. ♂; Peshwari, August 4, 1 ad. ♂. Kashmir, Baltistan: Skardo, August 13, 1 ad. ♂; Shrigar, August 21, 1 unsexed nestling.

***Carduelis carduelis paropanisi* Kollibay**

PERSIA: Mazenderan (region of Gurgan): Shah Kuh, July 16-20, 1940, 2 ad. ♂, 2 imm. ♂, 1 ad. ♀, 2 imm. ♀; Karimserai, July 20-21, 1 ad. ♂, 1 ad. ♀; Dimalu, July 22-24, 2 ad. ♀. Khorasan: Bujnurd, August 2, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀; Kotaliyekchinar, August 3-5, 6 ad. ♂, 2 imm. ♂, 1 ad. ♀, 1 imm. ♀; Bardu, August 19-21, 1 ad. ♂, 1 imm. ♂.

AFGHANISTAN: Khudi Khel, May 22, 1937, 2 ad. ♀; Sirotai, June 20, 1 ad. ♂; Nozi, June 22, 4 ad. ♂, 1 ad. ♀; Gandacheshma, July 10, 1 ad. ♂; Chakaran, July 17, 1 imm. ♂; Zebak, July 21, 2 ad. ♂; Jurm, August 6, 3 nestling ♀; Balkh, December 1, 1 ad. ♂; Terak, September 2, 1939, 1 ad. ♂, 1 imm. ♂; Safedsang, September 19-25, 10 ad. ♂, 2 imm. ♂, 10 ad. ♀, 1 imm. ♀, 1 unsexed ad.; Khami Deh, September 29, 1 ad. ♂; Gurzan, October 5, 1 ad. ♂; Burchao Pass, October 10-15, 10 ad. ♂, 8 ad. ♀; Kabul, November 15-20, 2 ad. ♂, 8 ad. ♀.

***Carduelis carduelis ultima* Koelz**

PERSIA: Kirman: Dehibakri Pass, January 30, 1940, 2 ad. ♂, 2 ad. ♀, February 13, 1 ad. ♀. Iran: Tomogaon, February 7, 1 ad. ♂; Guragan, February 10, 1 ad. ♂; Maskun, February 12, 1 ad. ♂. Fars: Niriz, March 29, 1 ad. ♂ (the type of *C. c. ultima*).

***Acanthis flavirostris brevirostris* Moore**

PERSIA: Azerbaijan: Livan, November 14-16, 1940, 5 ad. ♂, 2 imm. ♂, 3 ad. ♀, 5 imm. ♀, 1 unsexed imm.

Specimens in the collection of the American Museum from the Caucasus show that *brevirostris* is lighter and more tawny above, paler below but with darker stripes on the chest than nominate *flavirostris* from Sweden. My specimens from Azerbaijan are slightly paler below and, as a series, slightly tawnier above than specimens in comparative plumage from the Caucasus. This slight difference may be due to wear, as the Caucasus specimens are a little worn while those of Azerbaijan are fairly fresh.

***Acanthis flavirostris korejewi* Zarudny and Hårms**

PERSIA: Kirman: Mohamed Shah, January 7, 1940, 1 ad. ♀.

AFGHANISTAN: Zebak, July 20-21, 1937, 1 ad. ♂, 1 ad. ♀; Sanglich, July 26, 3 ad. ♂, 1 ad. ♀; Munjam Pass, July 27-28, 1 ad. ♂, 1 ad. ♀; Khash district, August 8, 1 imm. ♂; Kargasi Pass, August 9, 1 imm. ♀; Daraim, August 10, 1 imm. ♀; Mazar i Sharif, December 6, 2 ad. ♀; Sabz Pass, August 28, 1939, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀; Kohisaf, September 19, 1 imm. ♂; Safedsang, September 19-25, 5 ad. ♂, 5 imm. ♂, 1 ad. ♀, 4 imm. ♀; Burchao Pass, October 10, 1 ad. ♀.

The only adults in fresh plumage are the two females collected at Mazar i Sharif in Afghanistan. The other specimens are not

adult, or consist of adults and juvenals in the midst of the moult or showing extreme wear. When compared to my specimens of *brevirostris* from the Caucasus and Azerbaijan, these two females are lighter, the stripes on top of the head and breast are considerably paler, dusky in color, those on the back are less distinct, the pale edges of the tail and longer upper tail coverts are broader and whiter, and the wing coverts are rufous, not brown. I lack comparative material from central Asia, but the characters of these two specimens correspond exactly to Sushkin's detailed description of *korejewi* (1925, Proc. Boston Soc. Nat. Hist., vol. 38, p. 6).

The female specimen taken in January in Kirman in south-eastern Persia, though more worn, matches closely the two females from Mazar i Sharif.

The juvenal specimens are paler and not so distinctly marked as one juvenal topotypical specimen of *brevirostris* from Erzerum and the juvenal specimens of this race from Azerbaijan. Meinertzhagen (1938, Ibis, p. 502) stated that, although his series from Afghanistan was too badly worn to be identified with certainty, it agreed perfectly with a large series of *korejewi* in similar plumage examined in Leningrad.

***Acanthis flavirostris rufostrigata* Walton**

NORTHERN INDIA: Kashmir, Baltistan: Karzong, September 13, 1936, 4 ad. ♂, 1 ad. [♂], 1 imm. ♂, 2 ad. ♀. Kashmir, Ladak: Miru, September 25, 1936, 1 ad. ♂. Northern Punjab, Rupshu: Tso Kar, September 28-30, 1 ad. ♂, 1 ad. ♀, 2 imm. ♀; Tozeri, October 2-3, 2 ad. ♂; Rachogba, October 6, 1 ad. ♂, 1 imm. ♂.

All the specimens are moulting, and I lack sufficient material from Tibet to say whether the birds of Ladak and Baltistan differ, when in fresh plumage, from the birds of Tibet. Meinertzhagen (1926, Bull. Brit. Ornith. Club, vol. 46, pp. 96-97) has separated both populations (*ladacensis* and *baltistanicus*) on the basis of having, when in fresh plumage, the upper parts not so red as in the birds of Tibet (*rufostrigata*). *A. f. baltistanicus* is based on a single specimen which is said to differ from *ladacensis* in having a finer bill and "in not being so red."

Since all my birds from the various parts of Kashmir are identical in the shape of the bill and, as far as can be told, in coloration, it seems preferable, at least until *ladacensis* and *baltistanicus* are confirmed, to follow Sushkin and call them *rufostrigata*.

***Acanthis cannabina bella* Brehm**

SYNONYMS: *Linota fringillirostris* Bonaparte and Schlegel.

Acanthis cannabina merzbacheri Schalow.

Acanthis cannabina persica Kudashev.

PERSIA: Azerbaijan: Namin, November 5-6, 1940, 4 ad. ♂, 2 imm. ♂, 2 ad. ♀; Livan, November 15-18, 1 ad. ♂, 2 imm. ♂, 1 ad. ♀, 1 imm. ♀; Khoi, December 11, 5 ad. ♂, 4 ad. ♀. Mazenderan: Shah Kuh, July 16-20, 6 ad. ♂, 5 imm. ♂, 2 ad. ♀; Karimserai, July 21, 1 ad. ♂. Khorasan: Bardu, August 16-21, 1 imm. ♂, 1 imm. ♀. Iran: Karaj, March 16, 1943, 1 ad. ♂, 1 ad. ♀. Kermanshah: Shahabad, December 27, 1940, 3 ad. ♂, 3 ad. ♀; Qasr i Shirin, December 28-January 7, 1941, 6 ad. ♂, 4 ad. ♀. Bakhtiari: Qala Taiyak, February 17-March 4, 1942, 4 ad. ♂. Luristan: Durud, January 23-March 20, 1940, 11 ad. ♂, 11 ad. ♀, May 21-June 7, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀. Fars: Persepolis, March 10-13, 7 ad. ♂, 5 ad. ♀, 1 imm. ♀. Kirman: Mo-hamed Shah, January 6-7, 3 ad. ♀; Dehibakri Pass, January 30, 1 ad. ♂, 1 imm. ♀; Guragan, February 10, 5 ad. ♂, 2 ad. ♀; Paibene, February 14, 2 ad. ♂, 1 ad. ♀.

AFGHANISTAN: Gandacheshma, July 10, 1937, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀; Sufian, July 18, 1 ad. ♀; Tirgaran, July 19, 1 ad. ♂, 1 ad. ♀; Sabz Pass, August 28-29, 1939, 2 ad. ♂; Gharchi, October 3, 1 unsexed ad.; Gurzan, October 5, 1 ad. ♂, 1 ad. ♀; Kabul, November 20, 1 ad. ♂; Mazar i Sharif, December 6, 2 ad. ♂.

The above specimens were examined together with specimens in the American Museum of Natural History from the Caucasus (two males, one female), Syria, and Palestine (nine males, five females), and Russian Turkestan, mostly from the region of the Issyk Kul (13 males, two females). This large amount of material shows that when specimens in the same stage of plumage are compared, none of the populations from Asia Minor through Turkestan is separable from another.

The birds of northern Persia were separated as *persica* on the basis of having less red on the breast and paler upper parts than those of Turkestan. Four male specimens examined by Stresemann from northern Persia (1928, Jour. Ornith., vol. 76, p. 350), and two males examined by Paludan from the same region (1940, Danish scientific investigations in Iran, pt. 2, p. 31) had less red on the rump than in specimens from Turkestan. Stresemann also mentions that the distribution of the red on the forehead and breast was less extensive in his Persian specimens, and that they were also somewhat paler and more yellowish on the back.

A large number of specimens shows, however, that there is a considerable amount of individual variation in the distribution of the red, and specimens with a similar amount of red, whether

large or small, can be found in all my populations. The color of the back, wing coverts, and of the red feathers changes with the condition of the plumage; in specimens showing exactly the same degree of wear the coloration is identical in all my populations. Since the measurements given below also fail to show any difference in size, all the populations from Asia Minor through Turkestan should be called by the oldest available name, which is *bella* of Brehm (1845), the type of which came from Beyrouth.

Although the changes in the red have been discussed by Görnitz (1927, Jour. Ornith., vol. 75, p. 58), and the alterations in the plumage as a whole caused by wear are described in detail by

TABLE 1

MEASUREMENTS OF ADULT MALES IN SOME POPULATIONS OF *Acanthis cannabina bella*

Population	N	Wing	Tail	Bill
Caucasus	2	81.0, 81.0 —	50.0, 54.0 (52.00)	11.0, 11.0 —
Syria and Palestine ^a	9	80.0–83.0 (81.23)	49.0–57.0 (52.56)	10.5–11.5 (10.95)
Azerbaijan	9	79.0–83.0 (82.11)	49.0–54.0 (52.33)	10.0–11.0 (10.22)
Mazenderan ^a	7	81.0–84.0 (82.83)	50.0–54.0 (52.40)	11.0–11.5 (11.21)
Kermanshah to Luristan	25	79.0–86.0 (82.16)	50.0–58.0 (54.02)	10.0–12.0 (10.68)
Fars	7	80.0–85.0 (81.67)	52.0–56.0 (53.66)	10.0–11.0 (10.50)
Kirman	8	81.5–85.0 (82.94)	52.0–59.0 (52.60)	10.0–11.0 (10.33)
Afghanistan ^a	7	81.0–83.0 (82.33)	53.0–56.0 (54.10)	10.0–11.0 (10.66)
Turkestan ^a	13	81.0–86.0 (82.62)	49.0–55.0 (53.27)	10.0–11.5 (10.92)

^a Includes some worn specimens, to the individual measurement of which 2 mm. have been added when the tip of the feather is worn off.

Witherby (1938, Handbook of British birds, vol. 1, p. 80), the plumage sequence in my specimens may be briefly generalized. The palest stage (when the specimens have buffy edges on the feathers and are at their freshest) is in birds collected from October through December or into early January. The darkest stage (on the upper parts, when the buffy edges have been worn off, exposing the blackish brown streaks at the tip of the feathers) is best shown in birds from February and March. By the end of April the dark streaks are wearing off and the plumage is beginning to become uniform, and the most uniform and brightest birds, as well as the most worn, are those from the end of May through July. At the end of July or in early August a complete moult begins, to last

until the first few days of October. There is a certain amount of overlap or lag between the various regions. For instance, badly worn July birds from Mazenderan have not started to moult, whereas July birds from Afghanistan have done so, or December birds from Azerbaijan are a little more worn and therefore slightly darker than December birds from Kermanshah.

The measurements of the adult males used in this study are given in table 1.

***Callacanthis burtoni* Gould**

NORTHERN INDIA: Northern Punjab, Chamba: Tarlok Nalti, August 19, 1930, 1 imm. ♂. Kashmir: Tarakbal, July 31, 1936, 2 ad. ♂, 1 ad. ♀.

These specimens are worn and badly faded, but as far as I can tell, they appear to be similar to a small series from northern Punjab and Kashmir. In this series the wing of males measures 96.5, 97, 98, 99, 101, and in my two specimens 97+, 100. Except for a lone female taken on February 12 on the Nepal-Sikkim frontier, I have seen no material from the eastern part of the range. This bird is greenish, less ochre than a female from Kashmir. However, the latter, taken on October 1, is still moulting, and the difference may be due to wear. More specimens should be compared.

***Leucosticte nemoricola nemoricola* Hodgson**

NORTHERN INDIA: Northern Bengal: Darjeeling, Tiger Hill, December 23, 1936, 1 imm. ♀.

***Leucosticte nemoricola altaica* Eversmann**

AFGHANISTAN: Iskatul, July 23, 1937, 2 ad. ♂, 1 ad. ♀; Sanglich, July 26-27, 2 ad. ♂.

NORTHERN INDIA: Kashmir: above Tarakbal, August 1, 1936, 1 ad. ♀; Burzil, August 7, 1 ad. ♂; Deosai Plain, August 8, 1 ad. ♂. Kashmir, Baltistan: above Sodpur, August 10, 1 ad. ♂; Shrigar Nulla, August 22, 1 ad. ♂, 1 nestling ♂, 1 ad. ♀; Tale Pass, August 23, 2 imm. ♂; Chulunka, September 2, 1 imm. ♂. Northern Punjab, Chamba: Reling, July 3, 1936, 2 ad. ♀. Northern Punjab, Lahul: Koksar, June 6, 4 ad. ♂, 4 ad. ♀; Sum, June 6, 1 ad. ♀, October 26, 1 imm. ♂; Sisu, June 7, 1 ad. ♂; Tsokang Nulla, October 19-21, 4 imm. ♂, 1 ad. ♀, 1 imm. ♀.

This race differs from the eastern Himalayan race (*nemoricola*) by the color of the axillaries, which are straw yellow in *nemoricola* and pale ashy gray in *altaica*.

The above specimens with one exception are in worn plumage, and in this plumage all these birds are identical. Other specimens in fresh plumage from Baltistan to northern Punjab are identical. In addition to the fresh specimen collected at Tsokang Nulla in northern Punjab on October 19, a good series in the collection of the American Museum of Natural History from Kashmir, Baltistan, Ladak, and northern Punjab was examined. No specimen in fresh plumage from Afghanistan is available.

Hellmayr (1929, Field Mus. Nat. Hist., zool. ser., vol. 17, no. 3, p. 51) found that specimens from Kashmir and Ladak in the British Museum "appear to be identical with a series from the Tian Shan." I have seen too few Turkestan and Tian Shan specimens, but those in the American Museum of Natural History, both in fresh and worn plumage, are a little more rufous on the crown and sides of the face than the worn and fresh specimens from Afghanistan through northern Punjab.

MOULT: One of the Afghanistan specimens (July 27) and two from Baltistan (August 22) are beginning to moult, and in the October 19 bird from northern Punjab the moult is about finished.

LEUCOSTICTE BRANDTI

Although *Leucosticte brandti* has been the subject of two modern studies (Hellmayr, 1929, Field Mus. Nat. Hist., zool. ser., vol. 17, no. 3, pp. 51-57; and Stegmann, 1932, Jour. Ornith., vol. 80, pp. 111-114), the description of an additional race (*audreyana*) by Stresemann (1939, Ornith. Monatsber., vol. 47, p. 177) and the receipt of much fresh material from Dr. Koelz make it advisable to review briefly the present status of the species.

The fresh material, in addition to the specimens listed below, consists of a large series collected in 1931 in Ladak, Zanskar, and Rupshu. To these specimens and those already in the collection of the American Museum of Natural History I was able to add, thanks to the courtesy of their respective authorities, the specimens in the collections of the United States National Museum, the Chicago Natural History Museum, the Academy of Natural Sciences of Philadelphia, and the Museum of Comparative Zoölogy.

In all, 118 specimens were examined, the series being particularly useful in that about three-quarters of the specimens are in breeding plumage and were collected from the beginning of May to the end of July, a few of these specimens being from the first

part of August. The plumage is more or less worn, and the comparisons below apply only to such specimens. The specimens from the Rothschild Collection, the United States National Museum, and the Chicago Museum were part of the material used by Hellmayr. Unfortunately, no specimens were available of the two races *incerta* and *intermedia*, described by Stegmann (*loc. cit.*) from northeastern Tibet.

The following races are represented in my specimens:

***Leucosticte brandti brandti* Bonaparte**

Specimens from Russian Turkestan in central and northern Tian Shan have the lesser upper wing coverts broadly and conspicuously edged with pink, and the feathers of the rump are gray without pink edges.

***Leucosticte brandti pallidior* Bianchi**

Specimens from the southern border of the Tarim Basin (Sughet Pass, Sanju River Valley, and a topotype from Karasai) have no pink edges on the lesser upper wing coverts but have broad pink edges on the feathers of the rump. In general coloration this race is very pale, the palest of all the races.

A series taken in the Altyn-tagh, south of Lob Nor, in March and April is somewhat less worn but agrees with the general pale coloration of the breeding specimens from farther west. At the eastern end of the Altyn-tagh, in western Nan Shan, *pallidior* is replaced as the breeding form by *incerta*, which, according to Stegmann, is similar to *pallidior* but darker.

***Leucosticte brandti pamirensis* Severtzow**

My July specimens from northeastern Afghanistan, which incidentally are the first record of the species for that country, are intermediate as regards the pink markings between nominate *brandti* and *pallidior*. They have pink edges on the lesser upper wing coverts, unlike *pallidior*, but these pink edges are considerably narrower than in nominate *brandti*; their rump feathers are well marked with pink, unlike nominate *brandti*, but these markings are narrower than in *pallidior*. In general coloration, the Afghanistan specimens are much darker than *pallidior* and slightly darker than nominate *brandti*.

I have not examined other specimens of *pamirensis*, but I have no hesitation in identifying my Afghan specimens as such, for

their characters match exactly those given for this race by Hellmayr and Stegmann. I did examine a specimen taken on April 28 at Tagdumbash Pamir (U.S.N.M. No. 150276), but, as stated by Hellmayr, this specimen lacks the pink edges on the lesser upper wing coverts, and although identified by him as *pamirensis*, he remarks that it is "barely distinguishable from *L. b. pallidior* of the Sughet Range." It may have been a winter visitor of this last race, for I find that its general coloration is so very pale that I cannot distinguish it from the pale breeding birds (without pink markings on the coverts) of the Sughet Pass and Sanju River valley.

***Leucosticte brandti haematopygia* Gould**

Breeding specimens from Ladak taken not far from the type locality (Tso Morari Lake) and others from Rupshu and Zaskar are similar to *pallidior* in lacking the rosy edges on the lesser upper wing coverts and in having the feathers of the rump broadly margined with pink, but are much darker throughout in their general coloration and are more broadly and heavily streaked on the back. My specimens of *pamirensis* from Afghanistan are a little darker, grayer and duskier, less brown.

***Leucosticte brandti audreyana* Stresemann**

Four specimens taken in recent years at Gyagong, northern Sikkim, show that the birds of this region are different from those of Ladak and Rupshu. These specimens, two of which were taken while in worn breeding plumage on May 30 and June 6 and the other two in fresh winter plumage on November 22, are distinctly darker than my specimens in comparative plumage from Ladak and Rupshu. The difference is better marked in the fresh winter plumage. The rosy markings of the rump are similar.

I am unable to distinguish in any way from the May 30 and June 6 specimens from Gyagong, a series of six specimens collected in the region south of the Oring Nor at the eastern end of the Kunlun Shan Range. This series, which is from the Academy of Natural Sciences of Philadelphia, was collected 30 to 100 miles northeast of Jyekundo (Yushu) from May 4 to June 18. A little farther north, in the Burchan Budda Range, the dark *audreyana* is apparently replaced by a pale race, this race (*intermedia*) being described by Stegmann as appreciably lighter than *haematopygia*.

Although the birds of northern Sikkim are different from those of Ladak, Stresemann may have been in error in considering his four comparative specimens from Ladak to have been *haematopygia*. Stresemann's specimens had narrow rosy edges on the lesser upper wing coverts, and since they were collected on January 15 may have been winter visitors of *pamirensis*. I have examined a specimen taken by the same collector at the same locality (Khatlatse) on January 12, 1934. This specimen is similar in its general coloration to specimens in fresh winter plumage of *haematopygia* from Ladak and Rupshu (fresh specimens of *pamirensis* not seen), but has the narrow rosy edges on the lesser upper wing coverts of *pamirensis*, whereas these markings are lacking altogether in 49 specimens of *haematopygia*, in both fresh and worn plumage, from Ladak and Rupshu.

Leucosticte brandti walteri Hartert

Four specimens from northern Szechwan, including the type of *walteri* taken at Sungpan on April 6, are darker than the specimens from northern Sikkim and the region north of Jyekundo. The under parts are darker, and the crown, hind neck, and back are blacker. The rosy markings on the rump are much reduced, and they are lacking on the lesser upper wing coverts. Of the other three specimens, one was collected on February 25 at Tatsienlu and the other two at Jesila in May.

The following tabular key summarizes the variation in the races that I have examined. In some races (*brandti*, *pallidior*, and *pamirensis*) the terms are relative, for in about a third of the specimens of nominate *brandti* there are faint traces of pink on the rump; in two out of the seven Afghan specimens of *pamirensis* the rosy edgings on the lesser upper wing coverts are lacking, and there are very faint traces of them in two specimens of *pallidior* out of 19.

Race	Rosy Edges on Lesser Upper Wing Coverts	Rosy Edges on Feathers of the Rump	General Coloration
a. <i>brandti</i>	Broad	Lacking	—
b. <i>pallidior</i>	Lacking	Broad	Palest (very pale)
c. <i>pamirensis</i>	Narrow	Narrower than b	Darker than a
d. <i>haematopygia</i>	Lacking	Broad	{ Darker than b Browner than c
e. <i>audreyana</i>	Lacking	Broad	Darker than d
f. <i>walteri</i>	Lacking	Reduced	Darkest (very dark)

MOULT: The only moulting specimens examined are in series collected in early fall in Ladak and Rupshu. Adult specimens taken in September (7 to 26) are in various stages of a complete moult, the moult being generally well advanced, and nearing completion in a September 25 bird from Ladak and another from October 4 in Rupshu.

MEASUREMENTS: The measurements of the various populations are very similar. The following measurements are those of adults in worn breeding plumage only.

Race	N	Wing Length	N	Bill Length
<i>brandti</i>	7 ♂	114-122 (118.00)	7 ♂	12.5-14.0 (13.10)
	2 ♀	110, 116 (113.00)	2 ♀	12.0, 12.5 —
<i>pallidior</i>	12 ♂	112-124 (118.60)	11 ♂	12 -14 (12.90)
	7 ♀	108-121 (113.90)	7 ♀	12 -13 (12.50)
<i>pamirensis</i>	1 ♂	12 — —	1 ♂	13.0 (13.00)
	6 ♀	108-113 (110.70)	6 ♀	12 -13 (12.60)
<i>haematopygia</i>	16 ♂	110-125 (117.90)	22 ♂	12 -14 (12.80)
	11 ♀	110-116 (113.20)	16 ♀	11.5-14.0 (12.50)
<i>audreyana</i> (N. Sikkim)	2 ♀	112, 113 —	2 ♀	13.0, 13.5 —
<i>audreyana</i> (Jyekundo)	4 ♂	114-121 (116.50)	4 ♂	12.0-13.5 (12.40)
	2 ♀	108, 116 (112.00)	2 ♀	12, 12 —
<i>walteri</i>	3 ♂	112-119 (115.70)	3 ♂	12.5-13.0 (12.70)
	1 ♀	112 — —	1 ♀	13 — —
Type, <i>walteri</i>	♂	116 — —	—	12.5 — —

***Leucosticte brandti pamirensis* Severtzow**

AFGHANISTAN: Sanglich, July 26, 1937, 1 ad. ♂, 3 ad. ♀; Munjan Pass, July 27-28, 3 ad. ♀.

***Leucosticte brandti haematopygia* Gould**

NORTHERN INDIA: Kashmir, Baltistan: Karzong Pass, September 13, 1936, 1 imm. ♂. Kashmir, Ladak: Shakrot, September 25-26, 6 ad. ♂, 4 ad. ♀. Northern Punjab, Rupshu: Lachulung, October 4, 2 ad. ♀.

***Rhodopechys sanguinea sanguinea* Gould**

PERSIA: Azerbaijan: Livan, November 13-18, 1940, 6 ad. ♂. Luristan: Safed Kuh, May 13-15, 14 ad. ♂; Durud, April 6, 1 ad. ♂, August 27-28, 4 imm. ♀, 1 unsexed imm.

AFGHANISTAN: Nozi, June 21-22, 1937, 3 ad. ♂; Sufian, July 18, 1 ad. ♂; Zebak, July 20-22, 1 ad. ♂, 1 ad. [♂]; Iskatul, July 23, 2 ad. ♂; Sanglich, July 27, 1 ad. ♀; Sabz Pass, August 29, 1939, 1 ad. ♂, 1 imm. ♀; Burchao Pass, October 11, 1 imm. ♀.

The three series are in different plumages. The Azerbaijan birds (November) are in very fresh plumage, the May birds from

Luristan are worn, and the birds from Afghanistan from the end of June to the end of July are extremely or badly worn. With wear the plumage gets darker. The top of the head becomes black. The dark streaks of the mantle become prominent but finally wear off, leaving the color of the back a more or less uniform brown in very worn specimens. The breast and flanks get progressively browner. The rosy feathers, or rather their edges, turn from pink to rose and finally to scarlet. In adults the plumage is renewed by a complete moult (August 29 in Afghanistan), but in first year birds only the body plumage is changed, as shown by an October 11 specimen, also from Afghanistan.

The measurements given below show, with the possible exception of the tail, which is slightly longer in the Azerbaijan birds, that there are no differences between the three populations. There are also probably no color differences, as two May 13 birds from Luristan that are more worn than the rest of the series are identical in coloration with two June 21 birds from Afghanistan that are less worn than the rest of the series. Five adult males in the collection of the American Museum of Natural History taken in the mountains of Lebanon from June 19 to July 17 are inseparable from the Afghanistan males taken on virtually the same dates (June 21 to July 27).

Although the amount of white on the next to the outer pair of tail feathers varies individually, there is a tendency for the birds of Luristan to have a little less white than the birds of Lebanon and Azerbaijan, and the birds of Afghanistan in turn have a little less white than those of Luristan. However, this is only an average difference, for nine out of 15 of the Luristan birds and three out of nine of the Afghanistan birds have as much white as the Lebanon and Azerbaijan birds. In one of the Lebanon males the inner web of the feather is quite dark, and in my specimen from farthest east, a male from the mountains of Ferghana, these feathers are virtually pure white.

All the Safed Kuh birds had the testes enlarged, and the female from Sanglich was collected while laying.

MEASUREMENTS: To each individual measurement when the tips of the feathers are worn off, 2 mm. are added.

Lebanon, five males: Wing, 102+--107+ (106.0). Tail, 53+--57.0 (56.0). Bill, 13.0--13.5 (13.2).

Azerbaijan, six males: Wing, 106.0--109.0 (106.1). Tail, 56.0--63.0 (59.1). Bill, 13.0--13.5 (13.3).

Luristan, 15 males: Wing, 105+–110.0 (106.8). Tail, 52+–60.0 (56.2). Bill, 13.0–14.0 (13.3).

Afghanistan, nine males: Wing, 103+–108+ (106.1). Tail, 52+–59.0 (56.3). Bill, 13.0–13.5 (13.2).

Ferghana, one male: Wing, 106.0. Tail, 56.0. Bill, 13.0.

RHODOPECHYS MONGOLICA AND *RHODOPECHYS GITHAGINEA*

Rhodopechys mongolica Swinhoe is often treated as a race of *R. githaginea*. This treatment is not correct because:

A. The breeding ranges of *R. mongolica* and *R. githaginea crassirostris* Blyth overlap in parts of Afghanistan, in the region of Birjand in eastern Persia, and perhaps also in northern Persia.

B. There is some evidence that the two forms are separated ecologically.

C. The two forms differ widely in the basic pattern of the plumage.

A. DISTRIBUTION

The distribution of the two forms from the first of May to the end of August in the region under discussion is shown on figure 2. The records shown on the map were taken from the literature or are those of specimens examined. The latter are those taken by Koelz and those of a long series in the collection of the American Museum of Natural History taken by Zarudny in eastern Persia from 1895 to 1902. The records from the literature were taken from the following: Blanford (1876, Eastern Persia, vol. 2, p. 251, Macmillan, London), Zarudny (1900, Mem. Acad. Imp. Sci., St. Petersburg, ser. 8, vol. 10, pp. 171–174), Zarudny (1903, Mem. Soc. Imp. Russe Geogr., vol. 36, no. 2, pp. 248–249), Meinertzhagen (1920, Ibis, p. 138), Ticehurst (1927, Jour. Bombay Nat. Hist. Soc., vol. 31, p. 863), Meinertzhagen (1938, Ibis, p. 503), and Whistler (1945, Jour. Bombay Nat. Hist. Soc., vol. 45, p. 115). In addition, Mr. H. Grote has had the kindness to call to my attention some records which appear in a Russian paper not available in this country. According to this work, Buturlin and Dementiev (1941, Polnyi opredelitel' ptits S.S.S.R., vol. 5, p. 84), *R. mongolica* apparently breeds in Transcaucasia in the regions of the Araxes and Erzerum.

On figure 2 the zone of overlap of the breeding ranges is shown by cross hatching. Localities within this zone, or close to it, are

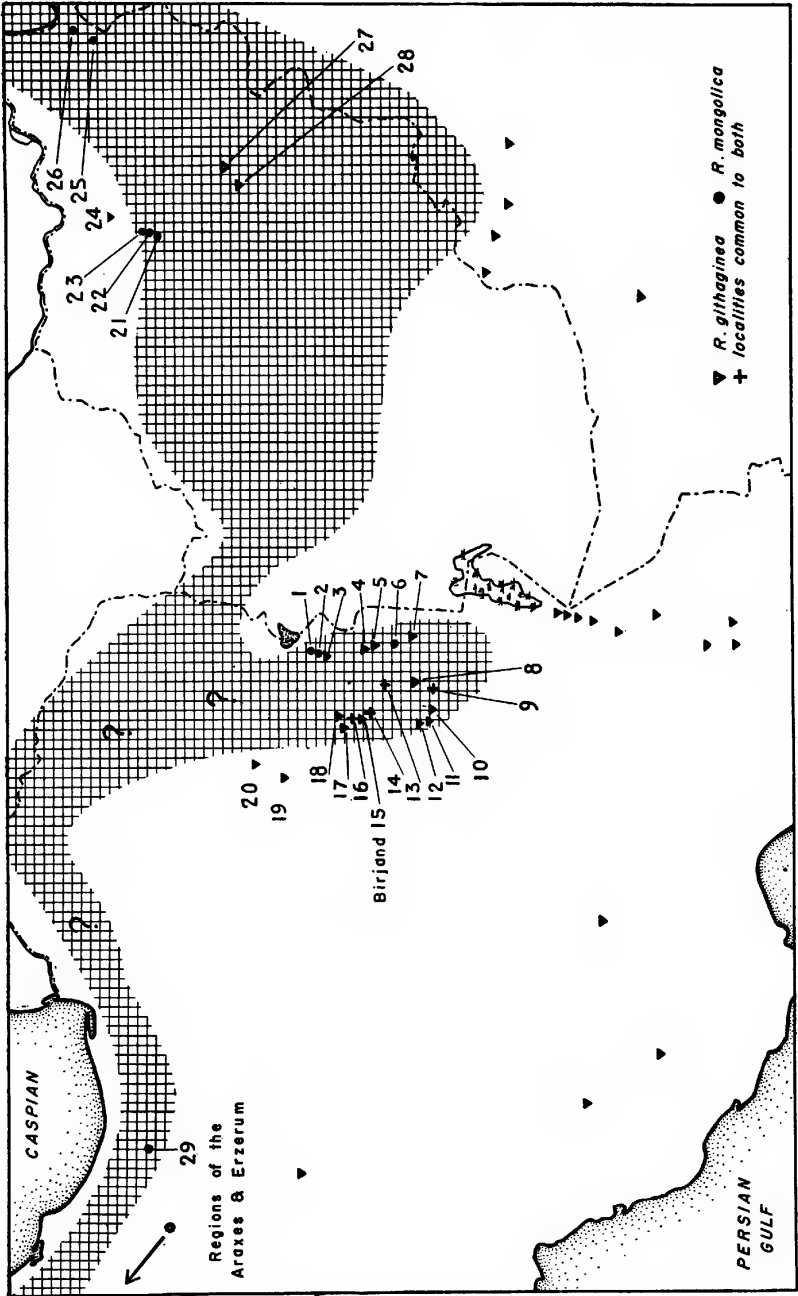


FIG. 2. Distribution of *Rhodopechys githaginea* and *R. mongolica* during the breeding season in Persia and Afghanistan. Cross-hatching: zone of overlap.

given below. The spelling of the name of the locality is according to the 1:1,000,000 International Map of the World revised to 1944, or, if it does not appear on that map, according to the 1:253,440 maps published by the Surveyor General of India in 1915 and revised in 1941-1943 by the United States Army Map Service. As Zarudny's dates are in the Russian calendar, 14 days are added to the given date in a bracket. Numbers preceding the name of the locality refer to the position on the map.

EASTERN PERSIA, REGION OF BIRJAND

Rhodopechys githaginea crassirostris

3. Gulmiran, April 26 [May 10]
4. Tabas, July 11 [July 25]
5. Gyoishe, July 1 [July 15]
7. Chah i Zirun, July 3 [July 17]
8. Ismailabad, June 12 [June 26]
10. Rume, May 15 [May 29]
11. Basiran, May 13 [May 27]
12. Khamur, May 10 [May 24]
15. Birjand, April 29 [May 13]
17. Kalateh Haji Yusuf, April 28 [May 12]
18. Sagi, June 22 [July 6]
19. Firdaus, August 29
20. Chopali, April 16 [May 1]

Rhodopechys mongolica

1. Shah Rakht, April 24 [May 8]
2. Ahangaran, April 24 [May 8]
6. Ratak bela, July 8 [July 22]

Localities common to both

9. Ku Bubak, May 17 [May 31]
13. Guliandar, June 15 [June 29]
14. Rikat in the Baqaran Kuh, May 4-7 [May 18-21]
16. Pasuk, June 22 [July 6]

Zarudny (1900) collected both species at Ku Bubak and Rikat and at Rikat on May 5 [May 19] found six nests of *R. mongolica*. One of the Ku Bubak specimens of *mongolica* is now in the collection of the American Museum of Natural History. At Guliandar and Pasuk he found *R. mongolica* to be common, but the only specimens collected were *R. g. crassirostris*, two nests of which were found at near-by Kalateh Haji Yussuf.

AFGHANISTAN

Rhodopechys githaginea crassirostris

- 24. Haibak, May 15
- 27. Chakri Minar, July 1
- 28. Ghazni road, June 20

Rhodopechys mongolica

- 25. Sanglich, July 26-27
- 26. Zebak, July 21
- 21. Sar i Asia, August 29
- 22. Kotai Sabzak (Sabz Pass), August 28
- 23. Balaghli (Baligali), August 30

Localities 27 and 28 were not found, but according to Whistler (1945, *ibid.*, vol. 45, p. 505) are in the neighborhood of Kabul.

Immature specimens collected by Koelz at Sar i Asia, Sabz Pass, and Baligali had probably bred locally. These localities are a little to the south of Haibak where Meinertzhagen (1938) found *R. g. crassirostris* breeding. Baligali and Sar i Asia, respectively, to the north and south of the Sabz Pass, are at the same altitude (about 3000 feet) as Haibak.

I agree with Zarudny (1900) that the description given by Blanford (1876) of the specimen collected on August 8 in the Karij Valley, in the Elburz north of Tehran (position 29 on figure 2), certainly seems to apply to *R. mongolica*. This record is of considerable interest as it connects the populations of this form breeding in eastern Persia to those cited by Buturlin and Dementiev (1941) as breeding in the regions of the Araxes and Erzerum in Transcaucasia.

B. ECOLOGY

Although our knowledge of the habits of *R. mongolica* and *R. g. crassirostris* is insufficient, and some of the information as to nesting sites is contradictory, *mongolica* seems definitely to breed at higher altitudes and to choose for its nesting sites the more solitary and the more rocky slopes. The nests of *R. g. crassirostris* have also been found on rocky slopes (Zarudny, 1900), but generally throughout its range it is found at lower altitudes and seems to prefer the more open semi-desert or desert hills and mounds. It can be found in desolate gorges but also nests in grassy territory. Apparently, according to Zarudny (1900), it prefers to be closer to

water than *mongolica* and is a more gregarious bird and nests in larger colonies.

C. PLUMAGE PATTERN

The distribution of the pigment follows a very different pattern, and the general coloration, although superficially alike, is not the same.

<i>Rhodopechys mongolica</i>	<i>Rhodopechys githaginea crassirostris</i>
Well streaked on the crown and back in both sexes	Streaks lacking on the crown in males, not well marked or lacking in females; lacking or faintly marked on the back in both sexes
Pale edges of secondaries much broader and much lighter, wearing down to whitish	Pale edges of secondaries much narrower and much darker, largely disappearing with wear
Pink on forehead more restricted and with a narrow but distinct pink superciliary streak showing up best in worn plumage	More pink on the forehead, no superciliary streak
General color of upper parts yellowish brown without pinkish tinge	General color of upper parts ashy gray brown with faint pinkish tinge
Basal part of the feathers of the crown brown in males in fresh plumage	Basal part of the feathers of the crown very pale gray in males in fresh plumage
Center of lower parts whiter in both worn and fresh plumage	Center of lower parts more pigmented, grayer, and pinker
With wear the rose color becomes a stronger red	With wear the rose color does not become so red
Immatures are streaky above, but less so than adults	Immatures are not streaky and have characteristic dull orange brown feathers on the head and back

To this may be added the shape of the bill, which in *R. g. crassirostris* is considerably heavier, broader, higher, and more swollen. It is also somewhat longer, 13 adult males of *crassirostris* measuring 10.0–11.5 (10.70), and 11 of *mongolica* 9.5–10.5 (10.0).

Rhodopechys mongolica Swinhoe

PERSIA: Kirman: Chaharfarsakh, January 16, 1940, 1 ad. ♀; Darzin, February 14–15, 2 ad. ♀. Yeزد: Shir Kuh, February 22–23, 5 ad. ♂, 3 ad. ♀.

AFGHANISTAN: Zebak, July 21, 1937, 1 ad. ♂; Sanglich, July 26–27, 3 ad. ♂, 1 ad. ♀; Sabz Pass, August 28, 1939, 3 imm. ♀; Sar i Asia, August 29, 1 imm. ♀; Baligali, August 30, 1 imm. ♂; Andkhui, October 25, 1 ad. ♀.

I lack comparative specimens in breeding plumage from north-western China and central Asia. In fresh plumage, four specimens taken at the end of October in northern Kansu are inseparable from my October specimen from Afghanistan, four November specimens taken by Zarudny in eastern Persia, and one of the specimens taken in February in Yezd in which the plumage is still relatively fresh.

MOULT: In one adult male taken at Sanglich in Afghanistan on July 27 a complete moult is just starting. In none of the other adult specimens taken at the same time has the moult started.

MEASUREMENTS: Adults in worn plumage taken during the breeding season in Afghanistan (5) and eastern Persia (1) by Koelz and Zarudny (very badly worn specimens not included). Wing, five males, 88.5–96.0 (92.70); one female, 87. Tail, five males, 51.5–58.0 (54.60); one female, 52.0.

***Rhodopechys githaginea crassirostris* Blyth**

PERSIA: Laristan: Isin, December 17, 1939, 1 ad. ♂, 1 ad. ♀. Kirman: Tomogaon, February 3–4, 1940, 2 ad. ♂, 2 ad. ♀; Darzin, February 14–15, 2 ad. ♂, 1 ad. ♀. Fars: Jahrum, March 21, 1 ad. ♂ "breeding," 1 ad. ♀ "building nest." Khorasan: Firdaus, August 29–30, 6 ad. ♂, 3 ad. ♀, 1 unsexed ad.; Shahrud, September 27, 1 imm. ♂.

AFGHANISTAN: Kandahar, October 24–26, 1937, 1 ad. ♂, 3 ad. ♀; Takhtipul, November 24, 1939, 1 ad. ♂.

I have no breeding specimens from Afghanistan, and my five fall specimens from this country in fresh plumage are identical to the specimens from Persia in fresh or slightly worn plumage.

The Kopet Dagh population separated by Zarudny as *bilke-witchi* was examined by Dementiev who, finding this name to be based on individual variation, made it synonymous with *crassirostris* (1934, L'Oiseau, p. 281). According to Hartert (1910, Vögel paläarktischen Fauna, p. 89), *crassirostris* differs from nominate *githaginea* by being a little larger, somewhat less pink, and a little grayer.

MOULT: All the adults taken on August 29 at Firdaus are in the last stages of a complete moult. The immature from September 27 at Shahrud is moulting into juvenal or first winter plumage, the moult involving only that of the body feathers.

MEASUREMENTS: Adults in worn plumage taken during the breeding season in eastern Persia by Koelz and Zarudny (very badly worn specimens not included). The two breeding birds

taken by Koelz at Jahrum are only partly worn. Wing, six males, 84–90 (88.0); four females, 84–87 (85.50). Tail, five males, 46–49 (47.60); three females, 43–48 (46.30).

***Rhodopechys obsoleta* Lichtenstein**

PERSIA: Kirman: Saidabad, December 28, 1939, 1 ad. ♀. Fars: Miyan Jangal (near Niriz), March 31, 1940, 1 ad. ♀. Luristan: Durud, May 26, 1 ad. ♂ "testes enlarged," May 1–2, 1941, 1 ad. ♂, 2 ad. ♀.

AFGHANISTAN: Khalat i Ghilzai, October 14, 1937, 2 ad. ♂, 4 ad. ♀; Farah, November 9, 1 ad. ♀; Herat, November 13, 1 ad. ♂; Balkh, November 29–December 1, 1 ad. ♂, 2 imm. ♂, 6 ad. ♀, 1 unsexed ad.

The May birds from Luristan were breeding or preparing to breed. In the collection of the American Museum of Natural History there is a June 17 specimen from the region of Gurgan and a young out of the nest from northern Khorasan. The Luristan birds are identical with other May specimens from Transcaspia (Merw, Utsch, Molla Kary).

All the Afghanistan specimens are in very fresh plumage, those from October just finishing the moult. All these fresh specimens are richer and a little darker than April and March birds from Turkestan (Djarkent), but the difference is probably due to wear. A large series of fresh fall specimens of both sexes from Palestine is inseparable from the Afghanistan specimens.

There is no difference in size between any of the series examined (Palestine, Persia, Transcaspia, Afghanistan, and Turkestan). The measurements of my Persian and Afghanistan adult specimens are as follows:

Wing: six males, 87.5–92.0 (89.10); 14 females, 83.0–87.0 (84.80). Tail: six males, 56.0–60.0 (58.0); 12 females, 54.0–60.0 (55.70). Bill: six males, 12.0–12.5 (12.25); 15 females, 11.5–12.5 (11.95).

CARPODACUS ERYTHRINUS

Geographical variation in *C. erythrinus* and the relationship of its various races have been discussed by Koslova (1939, Bull. Soc. Nat. Moscou, sect. biol., vol. 48, nos. 2–3, English summary, pp. 68–70). In this important paper the author recognizes five races, and the material I have examined supports this division. This material, 301 specimens, consists of the specimens taken by Koelz and those in the collection of the American Museum of

Natural History. Every important part of the range is represented with the exception of northern Mongolia.

***Carpodacus erythrinus roseatus* Hodgson**

TYPE LOCALITY: Nepal.

SYNONYMS: *Erythrina e. setshuanica* Stantschinsky.

Carpodacus e. murati Delacour.

As shown by adult specimens in worn plumage taken in May at Chumbi in extreme southern Tibet between Sikkim and Bhutan, this race is the darkest as well as the one showing the greatest distribution of the red pigment. The red is very deep carmine, purplish or madder. The whole upper surface is suffused with red, the color extending to the tips of the longest tail coverts; below, the red covers the whole of the flanks and the whole of the belly. Lacking specimens from high Nepal, I take these strongly colored specimens to be "typical" *roseatus*.

To the west the range of *roseatus* extends at least as far as Garhwal, from where I have a specimen, undated but identical in its coloration and degree of wear to the Chumbi birds. To the east the range extends probably as far as the Tsin Ling Range. Stantschinsky (1929, Jour. Ornith., vol. 77, p. 311) has separated the birds of Szechwan and Kansu as *setshuanica* on the basis of being lighter red than those of Sikkim. But Bangs (1932, Field Mus. Nat. Hist., zool. ser., vol. 18, no. 11, p. 373) could not distinguish in any way Sikkim specimens from his June birds taken at Tatsienlu, Szechwan, and his July birds from Yulong-Kong, south of Tatsienlu. I am also unable to separate my Chumbi specimens from a May specimen from the Likiang Range in northwestern Yunnan, two late June specimens from northern Kansu, and from a toptype (Sung-pan, Szechwan) of "*setshuanica*" taken on July 21.

Mr. Delacour informs me that he believes that *C. erythrinus* breeds in the high mountains of Tonkin and upper Laos. Until breeding specimens can be examined, I agree with Mayr (1941, Ibis, p. 360) that the differences given, so far, for *murati*, "much paler and more carmine pink," are not diagnostic. The type and toptypes were taken from December 14 to January 11 and could have been winter visitors in fresh, and therefore paler, plumage. I cannot distinguish November 15 and December 9 specimens from Chapa, Tonkin, from other specimens of *roseatus* in fresh plumage taken in their winter quarters in southern Bombay.

***Carpodacus erythrinus ferghanensis* Koslova**

TYPE LOCALITY: Shah-dara, Tadjikistan.

The author has separated (*op. cit.*) the birds breeding in the great mountain region which stretches from Kashmir northward to the Tarbagataï and westward through the Pamirs, Hindu Kush, and the Kopet Dagħ to northern Persia. Compared to *roseatus*, these birds are said to be brighter red, very bright scarlet rather than carmine, and to have less color on the belly; *grebnitzkii* is on the carmine side, and *erythrinus* and *kubanensis* are more rosy, not so bright, have less color below, and are paler above. Females of *ferghanensis* in worn plumage are darker than in the two latter races, but paler than in *grebnitzkii* [and *roseatus*]. This diagnosis is confirmed by my specimens from Kashmir (Zanskar, Ladak, and Baltistan), Russian Turkestan, and northeastern Afghanistan. July birds from the latter are identical with Ladak birds showing the same amount of wear.

Carpodacus e. ferghanensis and *roseatus* appear to replace each other in the region of Rupshu, a specimen from this region taken on July 23 at Rachogbar being exactly intermediate between the two races.

As noticed by Koslova, specimens from the Tian Shan and northern Persia are paler. In my series, specimens from these regions also have less red on the back than the Kashmir and Afghanistan specimens. A May specimen from the Semirychensk Mountains, a little to the north of my Tian Shan specimens, and another from farther north in the Altaï are still paler than the Tian Shan specimens. These two birds have more red below than does *erythrinus*, but in depth of color and amount of red on the back they are intermediate between *ferghanensis* and European specimens of *erythrinus*.

I have not examined specimens from the mountainous region which stretches through northern Mongolia and southern Siberia from the Altaï to the Transbaïkal region. According to Johansen (1944, Jour. Ornith., vol. 92, p. 92), the birds of the western part of this region are very variable and constitute a mixed population. The birds from the eastern part have been separated by Stantschinsky as *diamesa*. However, Stegmann (1931, Jour. Ornith., vol. 79, p. 153) says that examination shows this "race" to be completely unrecognizable.

Carpodacus erythrinus kubanensis Laubmann

TYPE LOCALITY: Karaul Kisha, Kuban district, northwestern Caucasus.

A lone male taken on July 23 at Dimalu in the region of Gurgan in northern Persia is a little less scarlet and has distinctly less red on the back than July specimens in identical plumage from north-eastern Afghanistan. This specimen suggests that the range of *ferghanensis* ends in the region of Gurgan. Specimens from farther west in northern Persia, examined by Stresemann from Gilan (1928, Jour. Ornith., vol. 76, p. 352) agreed well with a large series from the Caucasus. In my specimens, five males taken on the northern side of the Caucasus from the middle of May to the middle of July differ from *ferghanensis* by the shade of the red, which is bright rose rather than scarlet, and by having less red on the back and on the under surface of the body, the rosy color generally ending at the level of the lower breast. My large series taken at Karaj from April 23 to May 6 is in fresher, and therefore paler, plumage than the Caucasus specimens. Although these Karaj specimens may be birds taken while still on spring passage, the greater amount of red and its wider distribution show them to be *kubanensis* rather than *erythrinus*.

The five specimens from Luristan in southern Persia, three of which were taken from August 21 to 29 and had probably bred locally, are the first record of the species, whether as resident or as a migrant, in the Zagros Mountains. The two adult males are very worn. I have no specimens of *kubanensis* in similar plumage, but these birds appear to belong to this race, as they have more red on the breast, back, and upper tail coverts than specimens of *erythrinus* in comparative plumage from south central and northern European Russia.

Carpodacus erythrinus erythrinus Pallas

TYPE LOCALITY: Volga Basin.

SYNONYM: *Erythrina e. pallidirosa* Stantschinsky.

Although the difference in depth of color between *kubanensis* and *erythrinus* is very slight, the former being a trifle brighter, there are recognizable differences best appreciated in the distribution of the red pigment. Below, *erythrinus* is less pigmented, the rosy color generally ending at the level of the upper breast, the rest of the under surface being whitish or slightly tinged with pink.

The differences are best seen above; in *erythrinus* there is distinctly less red, the back is grayish brown with only a slight tinge of red which disappears altogether in very worn specimens, the rump is less red, and this color does not extend so far down on the tail coverts.

Although described from Tashkent in the range of *ferghanensis*, Stantschinsky's *pallidirosa* is a synonym of *erythrinus*, based on migrants of this race taken while on spring passage.

***Carpodacus erythrinus grebnitzkii* Stejneger**

TYPE LOCALITY: Kamtchatka.

All Russian authors agree that in eastern Siberia *erythrinus* is replaced by a darker race, *grebnitzkii*. There is, however, no agreement as to where the two races meet, but generally the region along the upper and middle Lena River is indicated. In my specimens, a small series taken along this river in June is identical with birds from European Russia. I also have a small series from the Commander Islands and one of Stejneger's specimens from Kamtchatka. Only one of the specimens is an adult male in red plumage; this specimen, taken on June 11 in the Commanders, cannot be distinguished from *erythrinus* males from European Russia. Stegmann (*op. cit.*) had the same trouble, and stated that only on the basis of female specimens could he recognize *grebnitzkii*. The females are said to be darker than the females of *erythrinus*, but in my series from the Commander Islands only one female can be said to be appreciably darker than my European females. Stejneger's specimen is a male in female plumage and is as pale as the palest females from Europe and the Commanders. On the basis of the limited material seen by me I cannot distinguish between *erythrinus* and birds from eastern Siberia, Kamtchatka, and the Commander Islands.

A series from northeastern China, however, differs from *erythrinus*. The specimens, which are probably migrants, were collected in Shantung in the latter part of May, and again in October and November. With one exception they are in worn breeding plumage. When compared to *erythrinus* and *roseatus* in similar plumage, both sexes are darker than in *erythrinus*, and the males have much more red on the back. The shade of the red is carmine as in *roseatus*, but the birds are considerably paler, and below the red is definitely more restricted. The females look like

the females of *roseatus*, that is, they are brownish and prominently striped below, and differ only by being paler.

The May specimens from Shantung are identical to a male specimen from Peking taken in "spring or summer." On Père David's authority, Latouche (1927, *Birds of eastern China*, p. 315) states that the species breeds sparingly in the mountains near Peking. Birds similar to the Peking and Shantung specimens may nest in the Khingan Mountains and the mountains along the lower Amur River.

More material must be examined before this issue can be decided. It is possible that typical *erythrinus* ranges all the way across northern Siberia to Kamtchatka and the Commander Islands, and that *grebnitzkii* is a synonym of it. In this case it might become necessary to give a name to the population of northeastern China and southeastern Siberia (lower Amur, etc.) which is intermediate between *erythrinus* and *roseatus*.

WINTER SPECIMENS: *Carpodacus erythrinus* winters in southern Asia from India to southeastern China, where, according to Latouche (*loc. cit.*), some birds winter as far north as Foochow. Some may winter still farther north, for I have a November female from Shantung in fresh adult winter plumage. With the exception of this specimen (the rest of my fall series from this region being still in worn plumage), my other specimens in fresh winter plumage were taken in Tonkin, northern Burma, and in India from southern Nepal to the Palni Hills in southern Madras.

Among these winter specimens it is evident that more than one form is present, and this has already been mentioned by Ticehurst (1938, *Ibis*, p. 615) for the birds of Burma, by Whistler for the birds of India (1939, *Ibis*, p. 158), and Deignan for the birds of northern Siam (1945, *Bull. U. S. Natl. Mus.*, no. 186, p. 567). All these authors recognize two forms, one a darker bird that they call *roseatus*, and the other a pale form, with more restricted rose color below, that they identify as *erythrinus*. Females are not mentioned, but my material shows that these also can be divided into two forms, a pale and a dark one, the latter being browner and more olive above and below, and with more prominent streaks extending farther down onto the abdomen.

Of the five races, four are certainly present in India, but the fifth, *grebnitzkii*, is not likely to reach so far west. This latter probably winters in southeastern China, and although not identified as such by Latouche, must, if only for geographical reasons,

form part of the migrants which, as Latouche says (*loc. cit.*), spread through in flocks through northeastern China in the spring on their way to Manchuria.

Among the Indian males it is easy to recognize *roseatus*. These specimens, even in the fresh plumage, retain the characteristic purplish carmine and the heavy saturation of the upper parts, and below the rose color covers the entire abdomen. The darker and more heavily streaked females also undoubtedly belong to this race. The pale rose birds with little color on the back, and in which the roseate hue of the under parts scarcely reaches the abdomen, must belong to *erythrinus* and *kubanensis*. In view of the individual variation in this species, it is quite impossible to distinguish further between the two. A number of intermediate specimens are left, and some of these have the rose color brighter than in *roseatus*, and the upper parts less saturated and brighter. These, I am quite satisfied, must be specimens of *ferghanensis*. The females, except for the dark and more heavily streaked specimens, are indistinguishable.

MOULT: In this species first-year males are indistinguishable from adult females and may breed while in this dress. It has been supposed, as Ticehurst says (1938, *Ibis*, p. 615), that at the next moult these first year males moult to the red plumage. However, out of some 200 to 300 specimens, Ticehurst failed to find a single specimen in worn female plumage moulting to red. Although I have had the same negative result as far as moulting specimens go, I have a specimen which shows that such must be the case. In this specimen, an adult male collected on April 26 of the Russian calendar [May 10] at Utsch-adj, Transcaspia, the streaked brown feathers of the female have been about half replaced by the red feathers of the male. As both the adult red and brown feathers are equally worn they must have been acquired at the same moult.

Out of the other 300 specimens the only ones I have found moulting are nine immatures (three males and six females) moulting into the juvenal female plumage in Ladak and Baltistan from September 6 to the 26. Adult specimens taken in this region, and in Persia and Afghanistan, during September had not begun to moult, but the moult was already over by November 8 in a specimen from Shantung, and specimens taken in early December in India were all in very fresh plumage.

MEASUREMENTS: No significant size differences were found to exist between the various populations. The following measure-

ments are those of the wing length of adult males in worn plumage taken while breeding or upon the breeding grounds from the end of April to early September.

erythrinus

Europe and Siberia east to the Lena 17 ♂, 83.0–88.0 (84.65)

kubanensis

Caucasus 5 ♂, 83.0–89.0 (85.40)

Northern Persia 17 ♂, 84.5–92.0 (87.53)

ferghanensis

Northeastern Persia 2 ♂, 88.0, 89.0 —

Afghanistan 8 ♂, 84.0–88.0 (86.50)

Kashmir (Zaskar, Ladak, Baltistan) 27 ♂, 83.0–90.0 (86.10)

Russian Turkestan 14 ♂, 84.0–88.0 (85.75)

roseatus

E. Himalayas to northwest China 10 ♂, 81.0–88.0 (84.55)

grebnitzkii

Commander Islands 1 ♂, 85.0 — —

C. e. subsp.

Northeast China 4 ♂, 84.5–89.0 (86.40)

REMARKS ON THE LIST OF SPECIMENS: In the list of the specimens collected by Koelz, given below, males in female plumage are listed as immatures. Specimens collected during the winter months in peninsular and southern India, or in March and early April in the lower Himalayas in southern Nepal, are not identified as to race, unless the dark color, the shade of the red and its wide distribution in the males, and the more prominent streaks of the females unmistakably identify these specimens as *roseatus*. In the unidentified specimens more than half are of the "*erythrinus* type," that is, the males are pale rose and have no pigment on the abdomen, and the females are paler and grayer, less brown, and are less heavily streaked below.

***Carpodacus erythrinus kubanensis* Laubmann**

PERSIA: Luristan: Durud, August 21–September 11, 1941, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀; Burujird, October 10, 1942, 1 imm. ♀. Iran: Karaj, April 30–May 6, 1943, 10 ad. ♂, April 23, 1945, 5 ad. ♂.

***Carpodacus erythrinus ferghanensis* Koslova**

PERSIA: Mazenderan (region of Gurgan): Shah Kuh, July 18, 1940, 1 imm. ♂; Karimserai, July 21, 1 imm. ♀; Dimalu, July 23, 1 ad. ♂. Khorasan:

Robat i Khan, September 3, 1 ad. ♂; Khaur, September 5-7, 1 ad. ♂, 3 imm. ♂, 2 imm. ♀; Turbati i Haidari, September 12, 1 imm. ♀; Sabzawar, September 23, 1 imm. ♀; Shahrud, September 26, 1 imm. ♀.

AFGHANISTAN: Kulali, May 10, 1937, 1 ad. ♂, 1 ad. ♀; Nozi, June 21, 1 imm. ♂; Zebak, July 21-22, 5 ad. ♂, 1 imm. ♂, 3 ad. ♀; Sanglich, July 26, 1 ad. ♀; Tali Khan, August 28, 1 ad. ♀; Shiburghan, September 10-14, 1 ad. ♂, 1 imm. ♂; Mukur, October 10, 1 imm. ♀; Terak, September 2-4, 1939, 2 ad. ♂, 3 imm. ♀; Katakala, September 17, 1 imm. ♂; Bai, September 18-19, 1 imm. ♂, 1 ad. ♀; Khami Deh, September 29, 1 imm. ♀; Laorlash, October 7, 1 imm. ♀; Bandar, October 9, 1 imm. ♂; Burchao Pass, October 13, 1 imm. ♀.

NORTHERN INDIA: Northern Punjab, Lahul: Gundla, June 8, 1936, 1 ad. ♀; Kolung, June 19, 1 ad. ♂; Kyelang, June 26-29, 2 ad. ♀. Kashmir, Baltistan: Shigar Nulla, August 21, 1 ad. ♀; Upper Tale Valley, August 23, 2 ad. ♂; Morungkor, August 24, 1 ad. ♂; Biokdang Nulla, September 4, 1 ad. ♂, 2 ad. ♀, 1 imm. ♀; Hundi, September 7, 1 ad. ♂, 2 imm. ♂; Hundan, September 10, 1 imm. ♂. Kashmir, Ladak: Kampuk, September 8, 1 ad. ♂, 1 imm. ♂; Pitug, September 19, 1 imm. ♀; She and Ranbisapur, September 23, 2 imm. ♀.

***Carpodacus erythrinus roseatus* Hodgson**

INDIA: United Provinces: Nichlaul, February 12, 1947, 1 imm. ♂; Khada, February 26, 1 imm. ♂. Central Provinces: Bheraghat, December 13-24, 1946, 1 ad. ♂, 1 ad. ♀. Southern Bombay Presidency: Londa, January 11-27, 1938, 1 ad. ♂, 2 imm. ♂, 3 ad. ♀. Southern Madras Presidency: Nilghiri Hills, Kunjapanai, February 19, 1 ad. ♂, 1 ad. ♀; Palni Hills, Kodaikanal, March 10, 1 ad. ♂.

***Carpodacus erythrinus* subspecies**

INDIA: Nepal: Bhimpedi, March 14, 1947, 1 ad. ♂; Thankot, March 26-April 10, 8 ad. ♂, 2 imm. ♂, 7 ad. ♀, 3 imm. ♀; Chitlang, April 16, 2 ad. ♂, 1 imm. ♂. United Provinces: Kalnahi, February 18, 1 ad. ♂; Khada, February 27, 1 ad. ♂. Central Provinces: Bheraghat, February 27-March 1, 1946, 2 ad. ♂, 1 ad. ♀, January 5, 1947, 1 unsexed imm. Northern Madras Presidency: Mahendra, January 24, 1937, 1 ad. ♂, 1 imm. ♀. Southern Bombay Presidency: Londa, January 10-27, 1938, 3 ad. ♂; Jagalbed, February 19, 2 ad. ♂. Southern Madras Presidency: Nilghiri Hills, Ootacamund, February 14, 1937, 1 ad. ♂, 1 ad. ♀.

***Carpodacus nipalensis nipalensis* Hodgson**

NORTHERN INDIA: Northern Bengal, Darjeeling district: Rangirum, December 26, 1936, 2 ad. ♂. Nepal: Thankot, March 21, 1947, 1 ad. ♀.

Kinnear (1937, Ibis, p. 475) states that he thinks that the differences observed by Baker (1925, Bull. Brit. Ornith. Club, vol. 45, p. 92) between *nipalensis* Hodgson and *intensicolor* were

caused by the age of the skins, and that, until further specimens are examined, Baker's *intensicolor* should not be recognized. However, when my two fresh male specimens of *nipalensis* from Darjeeling are compared to seven other fresh male specimens from northern Burma, northwestern Yunnan, Szechwan, and northern Tonkin, the Darjeeling birds are a little less intense in color and show a little more red on the back. The differences are slight and certainly are not so well marked as indicated by Baker. The extent of the dark band across the breast is not particularly diagnostic, as it varies individually and is also affected by the make-up of the skin.

The specimens of *intensicolor* used for comparison are in fresh plumage and were taken in recent years (1921–1934); they include a topotype (Mekong-Salween divide).

The opposite situation may prevail at the other extremity of the range. Whistler (1939, Bull. Brit. Ornith. Club, vol. 60, p. 16) has separated the western Himalayan population as *kangrae* (type locality, Dharmasala, Kangra), describing it as "Resembles the typical form, but the colour of the upper parts and of the breast is browner, less rich in tint." In specimens that I have examined, three fresh adult females from Rampur-Bashahr collected at the end of November, 1931, are not paler than my adult female from Nepal. One fresh adult male from Kulu collected in the middle of October, 1930, is paler and browner than my two males from Darjeeling, but the difference is extremely slight. All the specimens are in comparative plumage.

My material is insufficient and I have no fresh male specimens from Nepal, but *kangrae* seems to be based on slender ground. Whistler only had six skins, and some of them at any rate were very old, as they came from the Hume collection; the type itself is old, as it was collected in 1870. The browner color may be due to foxing or bleaching; that this does happen is amply shown by a dozen or so old skins from Sikkim.

A larger number of fresh specimens should be compared. They may show that *kangrae* is a recognizable race, as the evidence suggests that in this species a cline of increasing saturation runs along the Himalayas from west to east and from north to south from the Himalayas through Yunnan, Burma, and Tonkin.

The Koelz specimens measure: Wing, male, 87.0, 90.5; female, 81.0. Tail, male, 59, 59; female, 53. Bill, male, 12.5, 13.0; female, 12.0.

Carpodacus rhodochrous Vigors

NORTHERN INDIA: Northern Punjab: Chamba, Reling, July 3, 1936, 2 ad. ♀. Northern Punjab, Kulu: Kulu, January 10, 1933, 1 ad. ♂. Nepal: Chitlang, March 5, 1947, 1 ad. ♀.

This species, which has a limited range from Kashmir to the border of Sikkim, does not seem to vary. The adult male specimen from Kulu and seven others from Rampur in northern Punjab are identical to another adult male taken at Tanglo on the Sikkim side of the Nepal frontier. Seventeen adult females from Kashmir, northern Punjab, and Nepal also are identical.

MEASUREMENTS: Wing, male, 74; female, 69+, 70+, 71. Tail, male, 56; female, 51, 53, 55. Bill, male, 11.5; female, 10.5, 11.5, 11.5.

Carpodacus synoicus salimalii Meinertzhagen

AFGHANISTAN: Sufak, September 26, 1939, 1 ad. ♂, 2 ad. or first year ♀, 1 imm. ♀; Khami Deh, September 30, 1 ad. ♂, 2 imm. ♂.

These specimens were taken about 150 miles west-northwest of Meinertzhagen's original series from the Bamian Valley. They were compared to a topotypical series of *beicki* (Sining-ho, northern Kansu), and one of *synoicus*. The differences between *salimalii* and *beicki* are just as they were stated by Meinertzhagen (1938, Bull. Brit. Ornith. Club, vol. 58, p. 95). My specimens of *salimalii* are grayer, not so brown on the mantle in both sexes; and below, the rose of the males is brighter and, instead of being limited to the upper breast, extends almost as far as the vent. I have no specimens of *stoliczkae*, but Meinertzhagen, who examined a large series, states that this race from Chinese Turkestan differs from *salimalii* by being more sandy above and by having the rose color on the under parts of the male paler and more restricted. In *synoicus* the rose is redder, more intense, and covers the whole lower surface including the under tail coverts. On top, *synoicus* is tinged with pink from the crown to the rump, whereas *salimalii* is gray with only a slight trace of pink on the mantle, and *beicki* is pale gray brown with no suggestion of pink whatsoever. The pink area of the rump in *synoicus* is larger and extends to the tips of the upper tail coverts, in *salimalii* this area is more restricted and the pink does not extend so far down on the coverts, in *beicki* it is still smaller and there is no pink on the coverts.

MOULT: The females have just completed moulting the body

plumage, but the remiges and rectrices were not replaced, and these specimens may be first year birds. The two immature males have done the same and are indistinguishable from the females, and like them are probably first year birds. The immature female is moulting from the juvenal into first year plumage, and what is left of its juvenal plumage is tawnier and more streaky. The two adult males are just ending a complete moult and are in perfectly fresh plumage.

MEASUREMENTS: Adult males: Wing, 98.5, 101.0. Tail, 72, 74. Bill, 12.5, 13.0.

CARPODACUS RHODOCHLAMYS

Four races of *Carpodacus rhodochlamys* have been described. The northernmost *rhodochlamys* Brandt (type locality, Altaï) ranges from the Altaï through northern Ferghana. A large series of this race shows that this form is the most saturated and has perhaps a slightly heavier bill; in the males the little silvery pink feathers at the base of the bill usually extend all the way across the forehead.

The southern populations from the mountains of Afghanistan and the western Himalayas are paler, particularly on the crown and back which are duskier and grayer, less rosy, and they also lack the little silvery pink feathers on the center of the forehead. These southern populations can be divided into two forms. In my specimens, the westernmost (Bend i Turkestan Range on the northern side of the Hindu Kush in western Afghanistan south of Maimana) are slightly paler, and the streaks on the mantle are a little less conspicuous and a little narrower, than in specimens from eastern Afghanistan, Kashmir, and northern Punjab. These paler western birds have recently been described as *bendi* by Koelz (1949, Auk, vol. 66, p. 209). The darker eastern birds are *grandis* Blyth, the type of which came from the mountain ranges above Simla. My June specimens from this region of northern Punjab are identical to my June specimens from eastern Afghanistan. A first year male in very fresh body plumage taken at Terak in Afghanistan, about 150 miles east of my other first year specimens from the Bend i Turkestan, is slightly darker and has broader streaks. This specimen is identical with other first year birds in similar plumage of *grandis* from northern Punjab.

That the differences between *bendi* and *grandis* are not due to wear is shown by my specimens, which are all in perfectly fresh

plumage and were taken at exactly the same dates in September and October in the Bend i Turkestan and in the mountains of northern Punjab and of the Zanskar Range in eastern Kashmir. The differences between the two races, although slight, are constant and recognizable. They are best appreciated in adult specimens but are also shown by first year birds.

The fourth race, *kotschubeii*, described by Zarudny (1913, Mess. Ornith., p. 165) is said to have for its range southern Ferghana, the mountains near Bukhara, and the Alaï and the Pamirs. I had no specimens from this region, but according to the description—back colored as in *rhodochlamys* and silvery pink feathers lacking on the center of the forehead as in *grandis*—it would appear to be intermediate between the two.

A word of caution seems to be in order as regards the silvery pink feathers, for in six out of my 25 male specimens of nominate *rhodochlamys* these feathers are lacking or are very much reduced. These six specimens come from the Alatau and from the region of Djarkent in the Tian Shan well to the north of the range of *kotschubeii*. If this character is the only one by which this race can be separated from *rhodochlamys*, I believe that the validity of *kotschubeii* requires confirmation. Zarudny also said that his race was larger than *rhodochlamys* and somewhat smaller than *grandis*. In my specimens the wing length of 25 male specimens of *rhodochlamys* is 87.0–91.0 (88.75); and in 14 of *grandis*, 90.5–96.0 (93.65). The size difference, 5 mm., is too slight and the range of variation too great to allow recognition of an intermediate dimensional race.

MOULT: All my specimens of *bendi* and my fall specimens of *grandis* from northern Punjab are in the last stages of the moult. The adults have undergone a complete moult, and the other specimens, which are listed below as immature, appear to be first year birds as they have moulted the body feathers but not the remiges and rectrices. The June specimens of *grandis* from eastern Afghanistan were breeding. In this species, as in other *Carpodacus*, it is possible that first year males may breed while in female plumage. One of my first year males taken on June 19 at Sirotai had the testes much enlarged.

MEASUREMENTS OF KOELZ SPECIMENS: *Carpodacus r. grandis*: Eastern Afghanistan: wing, five males, 90.5–95.0 (93.40); five females, 89.0–92.0 (91.0). Tail, five males, 69.0–71.0 (69.80);

five females, 65.0–70.0 (67.30). Bill, five males, 14.5–15.0 (14.90); five females, 14.5–15.0 (14.75).

Northern Punjab: five males, wing, 91.5–96.0 (94.30). Tail, 69.0–71.0 (70.60). Bill, 14.5–15.0 (14.70).

Carpodacus r. bendi: Western Afghanistan: wing, male, 93.0. Tail, male, 73.0. Bill, six males, 14.5–15.5 (14.90), female, 15.0. In other specimens the tail and wing feathers do not appear to be full grown.

***Carpodacus rhodochlamys grandis* Blyth**

AFGHANISTAN: Gumandru, June 5, 1937, 1 ad. ♂, 1 ad. ♀; Sirotai, June 17–19, 4 ad. ♂, 1 imm. ♂, 4 ad. ♀; Terak, September 5, 1939, 1 imm. ♂.

NORTHERN INDIA: Northern Punjab, Spiti: Dankhar, September 25, 1933, 1 imm. ♂; Poo, September 27, 1 imm. ♀. Northern Punjab, Rampur-Bashahr: Lipe, November 19, 1930, 1 imm. ♀; Kunawar, Chala, October 2, 1933, 1 imm. ♀. Northern Punjab, Lahul: Kolung, June 11–14, 1936, 3 ad. ♂, 1 imm. ♂, October 11, 1 imm. ♂; Gunis [?], October 11, 1 imm. ♀; Gumrang, October 18, 1 imm. ♂; Tsokang Nulla, October 19–21, 2 ad. ♂, 3 imm. ♂, 1 imm. ♀

***Carpodacus rhodochlamys bendi* Koelz**

AFGHANISTAN: Maimana, November 18, 1937, 1 imm. ♂; Safedsang, September 19–25, 1939, 5 ad. ♂, 9 imm. ♂, 1 ad. ♀, 10 imm. ♀; Burchao Pass, October 15, 1 ad. ♂ (the type of *C. r. bendi*).

***Carpodacus thura blythi* Biddulph**

NORTHERN INDIA: Northern Punjab, Chamba: Reling, July 3, 1936, 1 ad. ♂. Northern Punjab, Lahul: Muling, October 24, 1936, 1 imm. ♂.

These two specimens agree with a series of *blythi* from western Kashmir. The immature male is in female plumage and appears to be a first year bird as it is moulting the body plumage but not the wing and tail.

MEASUREMENTS: Adult male: Wing, 87.0. Tail, 72.0. Bill, 13.5

***Carpodacus rubicilla eblis* Koelz**

SYNONYM: *Carpodacus rubicilla niethammeri* Keve.

NORTHERN INDIA: Kashmir, Rupshu: Puga, July 5, 1931, 1 ad. ♂ (the type of *C. r. eblis*). Kashmir, Ladak: Shakrot, September 26–27, 1936, 2 ad. ♂. Northern Punjab, Lahul: Dartse, October 10, 1936, 1 ad. ♀.

Comparing this race to *severtzovi*, Koelz (1939, Proc. Biol. Soc. Washington, vol. 52, p. 74) described it as "similar. . . [but] generally darker, especially on wings and tail, and has longer wing and tail." Whistler (1942, Jour. Bombay Nat. Hist. Soc., vol.

43, p. 36) rejects *eblis* because specimens from Spiti, Lahul, and Ladak examined by him and other workers were found to be identical with *severtzovi* from Turkestan. Whistler also cites Hellmayr (1929, Field Mus. Nat. Hist., zool. ser., vol. 17, no. 3, p. 48) who found that July specimens from Puga were "perfectly typical examples of *E. r. severtzovi*."

As far as the coloration is concerned I agree with Whistler and Hellmayr. My specimens from Puga and Ladak are not separable from males of *severtzovi* from Tian Shan, whether in fresh or worn plumage. However, neither Whistler nor Hellmayr gives any measurements. When measurements are compared, Koelz is quite correct in stating that *eblis* is larger than *severtzovi* and *kobdensis*.

In my specimens the type of *eblis* and eight males from Kashmir measure for the wing: 118, 120, 120, 120, 120, 121, 121, 122 (type), 124 (120.75); four males of *severtzovi* from Tian Shan measure 114, 114, 116, 117 (115.25). In my specimens in which the tips of the tail feathers are not worn off, five males of *eblis* measure 90 (type), 93, 93, 94, 97 (93.40), and three from Tian Shan 77, 78, 83 (79.30). Two topotypes of *severtzovi* measured by Koelz had the wing 113 and 115. Sushkin (1925, Proc. Boston Soc. Nat. Hist., vol. 38, p. 14) gives the wing length of an unspecified number of male specimens of *severtzovi* as "(112) 115-117," of 21 males of *kobdensis* from northwestern Mongolia as 110-119, and five males of this race from central Altaï as 108-111; the tail measures, respectively, 84-92, 86-98, and 87-90; no averages are given for either tail or wing length.

The differences may not be striking, but in the case of the wing they are clear cut, and since there is no overlap at all I believe *eblis* must be recognized.

Keve (1943, Anz. Akad. Wiss., Vienna, vol. 80, pp. 17-18) has described three "new races": *C. r. niethammeri*, Spiti to the Pamirs; *C. r. greschiki*, Kwenlun Mountains, eastern Turkestan; and *C. r. sushkini*, Tunkinsk Mountains, Siberia. The first is a pure synonym of *eblis*, while *greschiki* appears to be synonymous with *severtzovi*, and *sushkini* with *kobdensis*.

"*Carpodacus r. niethammeri*" is said to be larger and probably brighter, with the rosy color of the rump extending farther up onto the back, than *severtzovi*. The measurements given by Keve, wing of three males, 118, 118, 118, fall within the range of the measurements of *eblis* given above (118-124). As mentioned, neither

Whistler (*loc. cit.*), Hellmayr (*loc. cit.*), nor I, who have examined fresh specimens and much larger series than Keve, can see any difference in coloration.

"*Carpodacus r. greschiki*" is said to be much paler than *severtzovi*. However, the "new race" is based on a single specimen collected in 1890. Keve is aware of this deficiency, but says he is justified in naming a new race because other species found in this region have pale races. I will not comment on this reasoning, but I feel strongly that "*greschiki*" should be rejected, because a single old specimen taken in the same mountain range not too far from the type locality of *severtzovi* (upper Sanju River, according to Hellmayr) is grossly inadequate.

Keve describes "*sushkini*" as intermediate between *rubicilla* and *severtzovi* but does not indicate how it differs from *kobdensis*, a race from northern Mongolia that he does not mention but that has been described by Sushkin (*loc. cit.*) on precisely the same basis as "*sushkini*." Keve states that the characters of his "new race" correspond to the description that Sushkin (*loc. cit.*) gave for the birds of the Altaï. Sushkin, though a keen splitter, gave them, however, no name and on two separate occasions refrained from separating them from *kobdensis*. The birds of the Altaï were, however, redescribed later by Dementiev (1934, L'Oiseau, vol. 4, p. 285) who unwittingly used the name *altaica* and thereby became its author.

I hold therefore that "*sushkini*" is a synonym of *kobdensis*, or perhaps of *altaica*, if the latter is really distinct from *kobdensis*, and if the birds described by Keve are, as he believes, similar to the birds of the Altaï.

MOULT: The two males taken at Shakrot on September 26–27 were just completing the moult, and by October 10 the moult in the female from Lahul was over.

***Carpodacus rubicilla diabolica* Koelz**

AFGHANISTAN: Sanglich, July 26–27, 1937, 1 ad. ♂ (the type of *C. r. diabolica*), 1 ad. ♀.

This race (1939, Proc. Biol. Soc. Washington, vol. 52, p. 75), of which these two birds are the only specimens so far collected, is one of Koelz's most interesting discoveries. The female is too badly worn to be used for color comparison, but the male, which is also worn but less so, was correctly diagnosed as being inter-

mediate between *severtzovi* and nominate *rubicilla*. Compared to typical specimens of *eblis* and *rubicilla* also collected in July and a May specimen of *severtzovi*, all of which show about the same degree of wear, I find that the specimen of *diabolica* is dark carmine on the head and lower surface as in *rubicilla*, but the bird is less saturated and the color is lighter but not rosy as in *eblis* and *severtzovi*. On the mantle it has some of the reddish reflections of *rubicilla*, but they are fewer, and these reflections are lacking or very faint in *eblis* and *severtzovi*. The white centers of the feathers of the throat and head are a little larger than in *rubicilla* but considerably smaller than in *eblis* and *severtzovi*. In *rubicilla* the average size of these white centers on the feathers of the front part of the crown is about 0.5 mm., in *diabolica* 1.0 mm., and in *eblis* and *severtzovi* where they are identical 2.5–3.0 mm.

Carpodacus r. diabolica differs from all three by its heavier and slightly longer bill. In *diabolica* the bill measured from the skull is 17 mm. in the male and 16 in the female. The bill in *rubicilla* measures, three males, 14.0–15.0 (14.50), two females, 14.5, 14.5; in *eblis*, nine males, 14.5–15.5 (15.0), eight females, 14.0–15.0 (14.25); in *severtzovi*, four males, 14.5–15.0 (14.75), two females, 14.5, 15.0.

***Carpodacus rubicilloides lapersonnei* Meinertzhagen**

NORTHERN INDIA: Kashmir, Rupshu: Puga, July 5, 1931, 1 ad. ♂. Kashmir, Ladak: Pitug, September 21, 1936, 1 ad. ♀, 3 imm. ♀; She, September 22, 1 ad. ♂. Northern Punjab, Spiti: Shichiling, September 24, 1933, 1 ad. ♀. Northern Punjab, Rampur-Bashahr: Kunawar, Nago, October 5, 1 ad. ♂. Northern Punjab, Lahul: Dartse, October 10, 1936, 1 ad. ♂, 1 ad. ♀.

These specimens were examined together with another series from Kashmir and one of typical nominate *rubicilloides* from northern Kansu in the collection of the American Museum of Natural History. In fresh plumage, birds of Kashmir and northern Punjab are paler than *rubicilloides*, but in worn plumage the two races are indistinguishable. Although not mentioned by Meinertzhagen, *lapersonnei* is a little larger.

Meinertzhagen's six males of *lapersonnei* measured for the wing 110–113, no average given. My 10 males of this race measure 108.0–114.0 (110.70), and five of *rubicilloides* 103.0–105.0 (104.0). In the females, five specimens of *lapersonnei* have the wing length 103.0–109.0 (106.40), and two of *rubicilloides* 100.0, 100.0. In a much larger series of this latter measured by Meise (1937, Jour.

Ornith., vol. 85, p. 467), the wing in 13 females measured 98–102 (100.40), and 20 males 102–107 (105.0).

MOULT: Adults of *lapersonnei* taken from September 22 to October 5 were in the very last stages of a complete moult, and in October 10 specimens this moult had been completed. Immature specimens taken on September 21 had just about finished moulting into first year plumage.

THE GENUS *PYRRHOSPIZA*

I see no reason why this genus should be retained. It is monotypic, and in both sexes the plumage of its species, *puniceus*, is that of a typical *Carpodacus*. The distribution of the red pigment in the males is similar, and as in some species of *Carpodacus* (*rubicilla* and *rubicilloides*) its distribution on the individual feather is the same. The shape of the wing and tail in *puniceus* and its proportions are also similar to those of these two species. The rather longer and more attenuated bill of *puniceus* seems to me to be only of specific importance and does not warrant generic separation. I accordingly merge *Pyrrhospiza* Hodgson (1844) with *Carpodacus* Kaup (April, 1829).

Carpodacus puniceus humii Sharpe

NORTHERN INDIA: Northern Punjab, Chamba: Reling, July 3, 1936, 1 ad. ♂, 1 ad. ♀. Kashmir, Baltistan: Shigar Nulla, August 22, 1 imm. ♂.

These specimens are considerably paler than specimens of nominate *puniceus* from Sikkim and agree well with other specimens of *humii* from Kashmir.

MOULT: The immature male, a first year bird, is very interesting. It is in the midst of a complete moult, the brown streaky feathers of the female plumage being replaced by the rosy red feathers of the adult male on the front of the crown, throat, rump, breast, and abdomen.

MEASUREMENTS: Wing, adult male, 116, adult female, 106+. Tail, male, 75, female, broken. Bill, male and female, 17.

Pyrrhoplectes epauletta Hodgson

NORTHERN INDIA: Nepal: Thankot, March 18–April 12, 1947, 6 ad. ♂, 3 imm. ♂, 3 ad. ♀, 1 imm. ♀.

These specimens are identical with others from Sikkim. Two females, one taken on August 25 in northwestern Yunnan on the

Shweli-Salween divide and the other on December 26 at Htawgaw, northern Burma, are grayer on the upper part of the back and have the brownish parts of the plumage, above and below, less rufous than females from Sikkim and Nepal. There are no color differences between two males from northwestern Yunnan and males from Sikkim and Nepal. And in both sexes there is no difference in measurements between my specimens from Nepal, Sikkim, Yunnan, and Burma.

MOULT: The immature specimens were moulting into adult plumage.

MEASUREMENTS: Wing, six males, 75.0–80.5 (78.80); three females, 74.0–77.0 (75.30). Tail, six males, 54.0–61.0 (57.10); three females, 53.0–56.0 (54.20). Bill, five males, 12.5–13.0 (12.60); three females, 12.0, 12.0, 12.0.

***Haematospiza sipahi* Hodgson**

NORTHERN INDIA: Nepal: Bhimpedi, May 6, 1947, 3 ad. ♀.

Material from Nepal, Sikkim, northwestern Yunnan, northern Burma, Manipur, and Chin Hills has been examined. In addition to the specimens in the collection of the American Museum of Natural History, I have examined, thanks to the courtesy of their respective authorities, the specimens in the collections of the United States National Museum, the Chicago Natural History Museum, the Academy of Natural Sciences of Philadelphia, and the Museum of Comparative Zoölogy.

In adult females, and juvenal males in plumage similar to that of the adult female, there is a certain amount of individual variation in the barring of the under parts. That is, the dark center of the feathers of the breast, abdomen, and under tail coverts is more or less dark. In the three May females from Nepal these markings are distinctly paler than in two adult females from June taken in recent years in Yunnan, one on the Shweli-Salween divide and the other in the Likiang Range. However, a small series taken in the winter of 1930 in Sikkim shows the same range in variation.

There is no difference in the coloration of adult males. In specimens taken in recent years (1919–1938) in Sikkim, northwestern Yunnan, northern Burma, Manipur, and Chin Hills, the red has a rich carmine tinge. In old skins the carmine is lost, the color bleaching to scarlet.

MEASUREMENTS: There are no significant size differences. Nine adult males from Sikkim measure: wing, 100.0–102.0 (101.30); tail, 59–65 (61.80); bill, 15.0–16.5 (15.60). Nine from farther south (six Yunnan and one each northern Burma, Manipur, and Chin Hills); wing, 99–103 (101.30); tail, 55–65 (59.20); bill, 15.0–16.5 (16.0).

***Pyrrhula erythrocephala* Vigors**

NORTHERN INDIA: Northern Punjab, Kulu: above Bandrole, November 13, 1936, 1 ad. ♂.

I have examined a good series taken in November and December, 1931, in northern Punjab, but with the exception of three specimens taken in 1924 in the Chumbi Valley near Sikkim, I lack fresh specimens from the eastern part of the range. The Chumbi birds, two males and a female, although a little more worn as they were taken in the spring, are indistinguishable from the birds from northern Punjab. Stuart Baker (1926, Fauna of British India, vol. 3, p. 111) remarked that the birds from Nepal eastward appear to average darker than those of the western Himalayas. However, this difference might have been due to the age of the specimens, for in my specimens the fresh birds from northern Punjab and Chumbi Valley are darker and have brighter and richer reds or greens than a series of old specimens from Sikkim. The eastern birds average very slightly larger, but the difference is not significant and may be due to the size of the sample.

MOULT: In November, some of the adults from northern Punjab are completing the moult.

MEASUREMENTS: Western Himalayas (northern Punjab): Wing, six males, 76–80 (78.0); eight females, 75.5–79.0 (77.0). Tail, six males, 55–63 (58.50); eight females, 54–60 (57.50).

Eastern Himalayas (Sikkim and Chumbi Valley): Wing, six males, 78–81 (79.20); three females, 76–79 (78.0). Tail, six males, 58.5–65.0 (62.20); three females, 56.0–63.5 (59.80).

***Pyrrhula nipalensis nipalensis* Hodgson**

NORTHERN INDIA: Nepal: Thankot, March 24, 1947, 1 ad. ♂; Chitlang, April 17, 3 ad. ♂.

In this species, the gray color also fades with age. The fresh specimens from Nepal are darker gray than ancient bleached specimens from Sikkim taken from 1870 to 1880 or earlier. A

relatively young (1904) and apparently unbleached specimen from Sikkim is dark as in the Nepal specimens.

Pyrrhula nipalensis victoriae Rippon is a valid race. Stresemann (1940, Mitteil. Zool. Mus. Berlin, vol. 24, no. 2, p. 171) made it a synonym of *P. n. nipalensis* because he could not distinguish his large series of topotypical specimens (Mt. Victoria, Chin Hills) from the birds of Sikkim. Six of Stresemann's specimens, four males and two females, taken from April 17 to May 20, 1938, are now in the collection of the American Museum of Natural History. These specimens are darker on the crown and back, more saturated below, the gray color extending farther down, than in my equally fresh specimens of *P. n. nipalensis* taken at the same date (April 17).

Stresemann's 10 males measured 83–89 for the wing, no average given. The four males from this series from Mt. Victoria that I have measured have the wing 83.5, 86.0, 88.5, 90.0 (87.0), and the four males from Nepal, 85.0, 87.0, 88.5, 89.0 (87.37).

PYRRHULA PYRRHULA

Two races can be recognized in western Asia. One is *rossikowi* Derjugin in Transcaucasia (type locality, Tchorokh Basin, western Transcaucasia); and the other, *caspica* Witherby (type locality, Alumdeh, western Mazenderan) in Azerbaijan and along the southern coast of the Caspian.

My material of *rossikowi* is limited and consists of an adult male and three adult females taken in November and December in the province of Tiflis. These specimens are identical in coloration to two large series of nominate *pyrrhula* taken at the same time of the year at Pskov in western Russia and at Orenburg in eastern Russia in the region of the Urals. The Transcaucasian birds are slightly smaller and have a longer bill. There is also a very subtle difference in the shape of the bill. As Buturlin noticed (1906, Ibis, pp. 421–423), in the birds of Transcaucasia the basal half of the bill in both sexes is slightly more swollen, and the tip is more attenuated and more compressed laterally. The black cap in *rossikowi* has also been said to be "somewhat larger." However, I can see no differences, and this "character" is probably of no diagnostic value as it is variable and is affected by the make-up of the skin.

The three November and December females from Azerbaijan differ from the Transcaucasian and Russian specimens by their

coloration. Above, they are less tinged with yellowish brown on the lower back and rump, and, below, they are paler, mouse gray rather than pinkish brown. The difference is well marked.

Color differences in the males have always been emphasized; *rossikowi* was said to be brighter and more brick red than *pyrrhula*, and *caspica* was described as being nearer to *rossikowi* but still brighter. I find that the red color in the males is frankly impossible to assess. There is much variation in the two large Russian series; the red goes from bright and luminous to dull pale rose or to brick red. The male from Transcaucasia and the eight males from Azerbaijan can be matched repeatedly by some of the Russian specimens. Perhaps the Azerbaijan specimens are, as a series, slightly darker, slightly redder below, and slightly bluer above. But they are fresh specimens, and although the specimens used for comparison were taken at the same time of the year, they are older and the difference may be due to bleaching.

Measurements show that nominate *pyrrhula* has a longer wing and a shorter bill than *rossikowi* and *caspica*, the most significant difference being that of the bill. The measurements of only four males of *caspica* have been published (Witherby, 1908, Bull. Brit. Ornith. Club, vol. 23, p. 48; and Stresemann, 1928, Jour. Ornith., vol. 76, p. 351). These authors give only the wing length. Their measurements and those of Buturlin (*loc. cit.*) for *rossikowi* are given below with those that I have taken. The wing length in the various populations measures:

Mazenderan: Two males, 84, 87 (Witherby), two males, 88, 88 (Stresemann), the four males, 84–88 (86.75).

Azerbaijan: Eight males, 88–91 (90.37); three females, 87.5, 89, 89, (88.50).

Transcaucasia: One male, 91, five males, 90–95 (Buturlin), the six males, 90–95 (91.50); three females, 87, 88, 91, two females, 88.5, 91 (Buturlin), the five females, 87–91 (89.10).

Western Russia: Eleven males, 91–96 (93.13); 13 females, 89–96 (91.90).

Eastern Russia: Twenty males, 91–97.5 (93.67); 29 females, 89–95 (91.52).

The bill length measures:

Azerbaijan: Eight males, 10.5–12.0 (11.50); three females, 10.5, 11.0, 11.5 (11.0).

Transcaucasia: One male, 11.7; three females, 10.7, 11.3, 12.0 (11.30).

Western Russia: Eleven males, 9.3–10.5 (10.02); 13 females, 9.0–10.5 (9.85).

Eastern Russia: Twenty males, 9.5–10.7 (10.14); 29 females, 9.2–10.5 (9.91).

Buturlin (*loc. cit.*) does not give the bill length of his female specimens; that of four males from Transcaucasia is 9.5–11.2 (10.45) and that of nine males from Russia, 8.5–10.5 (9.50). These measurements are a little shorter than mine but were probably not taken in the same way. He gives the bill length as that of the "culmen" but does not state from what point it was measured. Mine were taken from the skull, probably a little farther back. As mentioned above, the bill in the Transcaucasian birds is shaped somewhat differently than in *pyrrhula*. The same small difference distinguishes it from the Azerbaijan specimens, the bill in these birds being longer than in *pyrrhula* but of the same shape.

I refer my Azerbaijan specimens to *caspica*. In so doing, I am aware that I have not examined specimens from the coastal region from which it was described. My specimen from Mazenderan is a young bird in juvenal plumage and unfit for comparison. There is a small size difference between my Azerbaijan birds and the published measurements of coastal specimens; however, these latter are very few. A female has never been taken, and I presume that the clear-cut difference that distinguishes my female specimens from Azerbaijan from those of *rossikowi* and *pyrrhula* will be found to be characteristic of the coastal birds.

***Pyrrhula pyrrhula caspica* Witherby**

PERSIA: Mazenderan (region of Gurgan): Dimalu, July 23, 1940, 1 imm. ♂. Azerbaijan: Livan, November 14–16, 3 ad. ♂, 1 ad. ♀; Maraghe, November 27–28, 5 ad. ♂, 1 ad. ♀; Rezaieh, December 6, 1 ad. ♀.

MYCEROBAS CARNEIPES

This species is divided into three races: nominate *carneipes* Hodgson (type locality, Nepal), *speculigerus* Brandt (type locality, northern Persia), and *nanschanicus* Meise (1937, Jour. Ornith., vol. 85, p. 459; type locality, Tschau-tou, northern Kansu).

The Koelz specimens and those in the collection of the American Museum of Natural History show that specimens from the western part of the range (northern Persia, Transcaspiia, Afghanistan,

Gilgit, the Alaï tagh Range in Ferghana, and Russian Tian Shan) are a little paler than specimens from the eastern part (northern Punjab, Nepal, Sikkim, northwestern Yunnan, Szechwan, and northwestern Kansu). In the western specimens (*speculigerus*), the black parts of the males are grayer, more sooty, not so dark nor so pure; and the females are paler on the back and breast than in the eastern birds. Among the latter, the specimens from Szechwan and northwestern Kansu (*nanschanicus*) are identical in coloration with the specimens from northern Punjab, Nepal, Sikkim, and northwestern Yunnan (*carneipes*), but differ from them by being larger and by having a heavier bill.

In my specimens the various populations of *speculigerus* vary somewhat from one another. The Tian Shan birds are a little darker, and these and the specimens from the Alaï tagh and Afghanistan are a little larger than the specimens from northern Persia. However, the difference in coloration is very slight, and the measurements show too much overlap or do not appear to be far enough apart to warrant separation. To these must be added the population of Baluchistan, for according to Ticehurst (1927, Jour. Bombay Nat. Hist. Soc., vol. 31, p. 862) specimens from this region are identical to those from Gilgit and Tian Shan.

MOULT: The complete post nuptial moult seems to take place earlier in first year birds than in the fully adult. On June 14 a first year male from northern Punjab and on June 18 a first year female from Afghanistan are in the midst of the moult. The first fully adult birds starting to moult are specimens from July 21 and 22 in the region of Gurgan. The moult continues through August (Khorasan), September (Afghanistan), to the middle of October and probably later in Afghanistan and northern Punjab. At this period, August 18 to October 18, juvenal birds acquire through a partial moult the body plumage of the first year; their quills are not changed.

MEASUREMENTS: In table 2 the measurements of the birds of northwestern Kansu are taken from Meise (1937, Jour. Ornith., vol. 85, p. 459). Three of these birds, a male and two females, are now in the American Museum of Natural History. As the width of the bill, in this case that of the lower bill at its greatest width near the gape, seems to be the least variable measurement, these measurements are given individually at the end of table 2.

Individual measurements of the bill width of the specimens in table 2, if already given in the table, are not repeated here: north-

TABLE 2
MEASUREMENTS OF ADULT MALES AND FEMALES OF *Mycerobas carneipes*

Region	N	Wing	Length of Bill	Width of Bill
Northern Persia (region of Gurgan)	10 ♂	114.0-120.0 (117.15)	21.0-23.0 (22.00)	14.0-15.5 (14.60)
	5 ♀	110.0-115.0 (113.50)	21.5-22.0 (21.90)	13.5-15.5 (14.60)
Northern Persia (Khorasan)	2 ♂	— Molt	21.5, 23.0	14.5, 15.0
	2 ♀	— Molt	22.5, 23.0	14.7, 15.0
Transcaspiæ	2 ♀	111.0, 115.0	22.5, 23.0	14.3, 15.0
Afghanistan	10 ♂	116.0-122.0 (118.45)	22.0-23.5 (22.95)	14.5-17.0 (15.40)
	8 ♀	115.0-121.0 (117.70)	22.0-24.0 (23.20)	14.7-16.5 (15.60)
Gilgit	1 ♂	122.5	24.0	15.5
Alai tagh	3 ♂	118.0-125.0 (121.40)	25.0-25.5 (25.10)	17.0-18.0 (17.30)
	1 ♀	114.0	22.5	15.5
Tian Shan	4 ♂	119.0-123.0 (121.40)	24.0-24.5 (24.10)	15.5-17.0 (16.10)
	8 ♀	113.5-120.5 (116.70)	22.0-23.5 (22.80)	14.5-16.0 (15.70)
Northern Punjab	2 ♂	116.0, 123.0	23.0, 23.0	15.0, 15.0
	4 ♀	114.0-118.0 (115.60)	22.0-23.0 (22.75)	14.0-14.7 (14.50)
Nepal	1 ♀	116.0	23.5	16.0
Sikkim	3 ♂	113.0-119.0 (116.00)	23.5-24.3 (23.80)	15.0-16.0 (15.50)
	1 ♀	124.0	23.5	17.0
Northwestern Yunnan	3 ♀	111.0-120.0 (115.00)	23.0-24.0 (23.50)	14.5-15.0 (14.70)
Szechwan	1 ♂	125.0	26.0	18.5
Northwestern Kansu	4 ♂	125.0-126.5 (125.90)	26.5 ^a	18.5 ^a
	4 ♀	119.0-129.0 (122.60)	25.0, 25.5 ^b	18.2, 18.5 ^b

^a One female.

^b Two females.

ern Persia (region of Gurgan), 10 males, 14, 14, 14, 14.5, 14.5, 14.7, 14.7, 15, 15, 15.5; five females, 13.5, 14.5, 14.5, 15, 15.5. Afghanistan, 10 males, 14.5, 15, 15, 15, 15, 15.5, 15.5, 15.5, 16, 17; eight females, 14.7, 15, 15, 15.5, 15.7, 16, 16, 16.5. Alaï tagh, three males, 17, 17, 18. Tian Shan, four males, 15.5, 16, 16, 17; eight females, 14.5, 15.5, 15.5, 16, 16, 16, 16, 16. Northern Punjab, four females, 14, 14.7, 14.7, 14.7. Sikkim, three males, 15, 15.5, 16. Northwestern Yunnan, three females, 14.5, 15, 15.

***Mycerobas carneipes speculigerus* Brandt**

PERSIA: Mazenderan (region of Gurgan): Karimserai, July 21–22, 1940, 10 ad. ♂, 3 imm. ♂, 5 ad. ♀. Khorasan: Bardu Forest, August 18–20, 2 ad. ♂, 4 imm. ♂, 2 ad. ♀, 4 imm. ♀.

AFGHANISTAN: Sirotai, June 18–19, 1937, 3 ad. ♂, 1 imm. ♂, 2 ad. ♀; Terak, September 3–5, 1939, 5 ad. ♂, 1 imm. ♂, 4 ad. ♀, 1 imm. ♀; Burchao Pass, October 12–15, 2 ad. ♂, 2 ad. ♀.

***Mycerobas carneipes carneipes* Hodgson**

NORTHERN INDIA: Northern Punjab, Lahul: Kolung, June 14–20, 1936, 1 ad. ♂, 1 imm. ♂, 3 ad. ♀, 1 imm. ♀; Kyelang, October 16–18, 1 ad. ♂, 1 ad. ♀; Gumrang, October 18, 1 imm. ♂.

***Mycerobas melanozanthos melanozanthos* Hodgson**

NORTHERN INDIA: Nepal: Chitlang, April 21, 1947, 1 ad. ♀.

This female is identical in coloration with other females from Sikkim, northwestern Yunnan, and Mt. Victoria in the Chin Hills. Adult males from northern Punjab, Sikkim, northwestern Yunnan, Szechwan, and Mt. Victoria are also indistinguishable.

The Nepal female is a little larger than my other female specimens, measuring 129 for the wing and 72 for the tail, as against 122, 125, and 67, 67, respectively, in specimens from Sikkim, 122, 125, and 66, 69 for northwestern Yunnan, and 119–124 in seven females from Mt. Victoria measured by Stresemann (1940, *Mitteil. Zool. Mus. Berlin*, vol. 24, no. 2, p. 170).

As noticed by Stresemann the birds of Mt. Victoria have a slightly longer bill. The length of the bill measured from the skull in adults is: Mt. Victoria, males, 28, 28; females, 26, 26; Himalayas, Yunnan, and Szechwan, nine males, 24.5–27.5 (25.90); five females, 24.0–25.5 (24.70). There are no differences in the width of the bill. In these nine male specimens the wing length is:

northern Punjab, 125, 127; Sikkim, 129, 129, 131; northwestern Yunnan, 124, 126, 129; Szechwan, 126, average of the nine, 127.30. Stresemann's 10 males from Mt. Victoria measured 122-128, no average given.

***Mycerobas icterioides* Vigors**

NORTHERN INDIA: Kashmir: Tarakbal, July 31, 1936, 1 imm. ♂, 1 ad. ♀. Northern Punjab, Kulu: above Bandrole, November 13-14, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀.

MOULT: The immature male taken on July 31 is a first year bird moulting into adult plumage. The adults from November are in the very last stages of a complete moult. At this date, the immature female is moulting from the juvenal to the first year plumage, the moult is partial, only the body feathers being changed; the new body plumage is indistinguishable from that of the adult female.

MEASUREMENTS: Wing: two males, 133, 135; three females, 130, 131, 133. Tail: male, moulting; two females, 90, 90. Bill: two males, 24, 27; three females, 24, 24, 25.

***Coccothraustes coccothraustes nigricans* Buturlin**

PERSIA: Iran: Dehibakri Pass, January 30, 1940, 2 ad. ♂. Kirman: Mas-kun, February 13, 1 ad. ♀. Mazenderan (region of Gurgan): Gurgan, July 10-11, 2 ad. ♀; Kherat, July 25, 1 ad. ♀. Azerbaijan: Namin, November 6, 1 ad. ♂, 1 ad. ♀; Livan, November 14, 1 ad. ♀; Maraghe, November 27, 1 ad. ♂; Saujbulagh, December 3, 1 ad. ♂. Bakhtiari: Baraftab, January 30, 1941, 1 ad. ♀; Ti, February 2-12, 5 ad. ♂, 3 ad. ♀; Imarat, February 14-19, 4 ad. ♂, 3 ad. ♀. Luristan: Durud, March 1, 1 ad. ♀.

The three females taken during July in the region of Gurgan are badly worn and of little use for color comparison. The rest of the specimens, collected from November 6 to March 1 in various parts of Persia, are in fresh plumage. Compared to specimens of nominate *coccothraustes* from western Europe in similar plumage, the male Persian specimens are slightly darker on the upper parts, that is, the mantle is deeper and duller umber, a little less rich. I can see no difference in the coloration of the head and nuchal band. Below, the difference is better marked; the Persian birds are pinker, less brownish. The Persian females are duller on the mantle, and below they are paler, whiter, less grayish.

Stresemann (1928, Jour. Ornith., vol. 76, p. 347) was unable to separate his five April specimens from Gilan and his July specimen

from the region of Gurgan, from German specimens of nominate *coccothraustes*. In my material, although a few individual specimens are not separable, the Persian specimens can be separated as a series from the specimens from western Europe. But the difference is very slight, particularly in the coloration of the upper surface.

I have not examined specimens from the Caucasus, and in calling my birds *nigricans* (the type locality of which is Tiflis), I am guided by Dementiev's description of this race (1934, L'Oiseau, p. 269). This author, in his review of the Russian races, states that *nigricans* differs from nominate *coccothraustes* by being, as in the case of my Persian specimens, darker on the back and pinker below. However, if the differences between the birds of the Caucasus and those of western Europe are not better marked than in the case of my specimens, it may be asked what purpose can be served by recognizing in the nomenclature such subtle distinctions.

The size of the bill has been used for subspecific discrimination, but the large number of specimens examined by Dementiev fails to support such a difference. There is also no difference in the length of the wing; my Persian specimens do average very slightly larger, but the difference is very small and does not appear to be significant.

MOULT: The July 25 specimen from Kherat was just starting to moult.

MEASUREMENTS: Wing, Persia, 14 males, 101–110 (104.50); western Europe, 26 males, 96–107 (102.75).

Persia: Wing, 13 females, 98.5–106.0 (101.90). Tail, 14 males, 49.0–55.5 (51.75); 13 females, 46.5–54.0 (50.50). Bill, 14 males, 20–22 (21.30); 14 females, 20.0–21.5 (20.60).

